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ESL-TR-87-01

**LISTING OF TECHNICAL REPORTS  
PUBLISHED FROM CY 1974  
THROUGH CY 1986  
PART III of III (PAGES 501-691)**

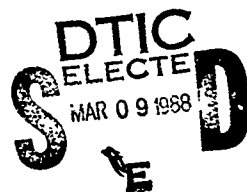
J.A. BIER

HQ AFESC/RDXI  
AF ENGINEERING & SERVICES CENTER  
TYNDALL AFB FL 32403

OCTOBER 1987

FINAL REPORT

JANUARY 1974 - DECEMBER 1986



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**ENGINEERING & SERVICES LABORATORY  
AIR FORCE ENGINEERING & SERVICES CENTER  
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## REPORT DOCUMENTATION PAGE

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) This technical report lists all technical reports published by this Laboratory from calendar year 1974 through calendar year 1986. It provides MAJOMs and other potential users with abstracts and information needed to order more copies of each report from Defense Technical Information Center (DTIC) and National Technical Information Services (NTIS). This publication is broken into Parts I, II, and III because of its length. Part I consists of pages 1 through 196, Part II contains pages 197 through 500, and Part III contains pages 501 through 691.			
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Previous editions are obsolete.

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# PREFACE

This report was prepared by the Headquarters Air Force Engineering and Services Center, Engineering and Services Laboratory (HQ AFESC/RDXI), Tyndall Air Force Base, Florida 32403.

This report contains a compilation of Engineering and Services Laboratory (ESL) technical reports covering civil and environmental engineering research and development published between calendar years 1974 and 1986. This list was obtained from Defense Technical Information Center and prepared by our Technical Library. AFESC/RDXI project officer was Captain Jeffrey A. Bier

This technical report has been reviewed and is approved for publication

*Jeffrey A. Bier*  
JEFFREY A. BIER, Capt, USAF  
Chief, Management Information  
Branch

*Lawrence D. Hokanson*  
LAWRENCE D. HOKANSON, Col, USAF, BSC  
Director, Engineering  
and Services Laboratory

*Larry T. Bramlitt*  
LARRY T. BRAMLITT, Maj, USAF  
Chief, Programs and  
Requirements Division

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A119 030 CONTINUED

SYSTEMS TECHNOLOGY INC XENIA OH

(U) A Field Test Using DRDF in a Spreader Stoker Hot Water Generator

DESCRIPTIVE NOTE Final rept Sep 80-Jul 81.

AUG 81 1979

PERSONAL AUTORS Carpenter, Paul F , Kleinhenz Ned J ,

CONTRACT NO WPR-N-90-47

PROJECT NO 2054

TASK NO 50

MONITOR AFSC/ESI  
TR-81-57

## UNCLASSIFIED REPORT

ABSTRACT (U) The objective of this report was to provide an evaluation of boiler performance and environmental emissions when combusting densified forms of refuse-derived fuels (DRDF) in a military scale (40-300 MBTUH capacity) spreader stoker fired boiler. The boiler tested is located in Building 1240, Heating Facility at Wright-Patterson Air Force Base, Ohio. The field tests were designed to investigate (1) the material handling characteristics of DRDF, (2) boiler performance, i.e., boiler efficiency, spreader limitations, IHHM production, combustion properties, slagging, fouling, and clinkering, and (3) environmental emissions, i.e., electrostatic precipitator performance, particulate emissions (size, mass rate, and resistivity), gaseous emissions (trace gases, CO, and SO<sub>2</sub>). The test demonstrated that on the operational performance of a military hot water generator operated at one-third of its capacity. The boiler burned well with adequate fuel burn-out and boiler response. A three-and-one-half percent decrease in efficiency occurred during DRDF firing. There was no significant change in electrostatic precipitator removal of particulate emissions as a result of firing DRDF compared with coal. Some heavy metal emissions (nickel, zinc, chromium) were higher for DRDF than coal (Author).

AD-A119 030

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PAGE 2-8

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DESCRIPTORS (U) Boilers, Air force facilities, Emission, Fuels, Solid wastes, Combustion products, Environmental impact, Efficiency, Combustion, Coal, Density, Gases, Particulates, Heavy metals, Electrostatic precipitation, Hot water, Field tests

IDENTIFIERS (U) Densified forms, Refuse derived fuels Spreader stokers, PB84708F, MOESL2054077

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A118 930 11/2 13/2 1/5  
 NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE  
 (U) Portland Cement Concrete Recycling Technology Review  
 DESCRIPTIVE NOTE Final rept Aug 81-Jan 82.

JAN 82 70P  
 PERSONAL AUTHORS McKean, P. Gordon, Newcomb, David E.  
 REPORT NO NMRI-5 07-TAB-6  
 CONTRACT NO F28601-81-C-0013  
 PROJECT NO 2104  
 TASK NO 1A  
 MONITOR AFSC/ESL  
 TK-82-11

## UNCLASSIFIED REPORT

ABSTRACT (U) The review of current technology pertaining to the recycling of existing portland cement concrete pavements was conducted. The purpose was to assess the applicability of recycling to U.S. Air Force pavement rehabilitation work. Costs of alternatives were reduced to simple models for use in evaluating sensitivity to cost factors. A study of projects on which this technology was used identified aggregate cost and haul distance as key factors.

DESCRIPTORS (U) \*Cements, \*Concrete, \*Recycled materials, \*Landing fields, Pavements, Cost analysis, Air Force facilities, State of the art

IDENTIFIERS (U) PEG3723F, WJAFESC212041A28

AD-A118 930

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PAGE 267 055028

## SEARCH CONTROL NO 055028

AD-A118 267 13/2 21/4 21/8  
 CALIFORNIA UNIV RIVERSIDE, STATEWIDE AIR POLLUTION  
 RESEARCH CENTER

(U) Atmospheric Reaction Mechanisms of Amino Fuels  
 DESCRIPTIVE NOTE Final rept 1 Jan-31 Dec 81.

MAR 82 222P  
 PERSONAL AUTHORS Tucson, Ernesto C., Calver, William P. L., Brown, Richard V., Atkinson, Roger, Miner, Arthur M.  
 CONTRACT NO F08635-81-C 0041  
 PROJECT NO ILIN  
 TASK NO 81  
 MONITOR AFSC/ESL  
 TR-82-17

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes a detailed investigation of the atmospheric reactions of hydrazine (N2H4), monomethylhydrazine (MMH), and unsymmetrically dimethylhydrazine (UDMH) relevant to assessments of the impact of their releases to the atmosphere as a result of their wide use as fuels for military purposes. Experiments were conducted in 3800 and 8400 1 Teflon reaction chambers, with reactant and product concentrations measured by varying pathlength (88.3-102.4 m) Fourier transform infrared (FT-IR) spectroscopy.

DESCRIPTORS (U) \*Air pollution, \*Amine fuels, Toxic hazards, Rocket propellants, Methyl hydrazines, Dimethylhydrazines, Reaction kinetics, \*Soot, Absorption coefficients, Concentration (Chemistry), Hydrazines, Infrared spectra, Atmospheres, Release

IDENTIFIERS (U) Tef on, PEG1101F, WJAFESCILR8101

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A118 022 21/4 21/2

RYCON INC CINCINNATI OH

(U) Performance Analysis of Corfiring Densified Refuse  
Derived Fuel in a Military Boiler

DESCRIPTIVE NOTE Final rept Aug 20-Sep 81

DEC 81 93P

CONTRACT NO MIPR-N-80-60

PROJECT NO 2054

MONITOR AFESC/ESL  
TR-81-59

## UNCLASSIFIED REPORT

**ABSTRACT (U)** This report provides an overview of existing densified refuse-derived fuel (dRDF) receiving, storage, handling and combustion equipment at Wright-Patterson Air Force Base. dRDF is being burned as part of a long term alternative fuel evaluation program. To develop design and procurement criteria for multiple fuel boilers, Recommendations are offered for specific equipment, procedural changes, and studies to improve the efficacy of the present configurations of dRDF as a fuel. A discussion of the fuel use criteria is presented. The options for continuing the present dRDF supply arrangement vs the feasibility of local production of dRDF are presented. Research needs are summarized. A preoperative, integrated local synthetic solid fuel production facility and boiler performance test is recommended as a continuation of the program. (Author)

**DESCRIPTORS (U)** \*Solid wastes. \*Solid fuels. \*Boilers. \*Synthetic fuels. \*Combustion. Density. Test methods. Safety. Air Force facilities.

**IDENTIFIERS (U)** WUAESC20545017. PB84708F

AD-A118 022

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AD A117 928

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AD-A117 928 21/4 7/4 13/2

VIRGINIA INST OF MARINE SCIENCE GLoucester Point

(U) Hydrocarbon Fuel Chemistry Sediment Water Interaction

DESCRIPTIVE NOTE Final rept Nov 80-Nov 81.

NOV 81 81P

**PERSONAL AUTHORS** MacIntyre, M G . Smith, C L . DeFur, P U . Su, C W .

CONTRACT NO F08635-81 C-0019

PROJECT NO 1900

TASK NO 20

**MONITOR** AFESC/ESL  
TR-82-08

## UNCLASSIFIED REPORT

**SUPPLEMENTARY NOTE** Includes ten microfiche inserts

**ABSTRACT (U)** The objective of this program was to determine the effects of sediments on aqueous solutions of selected Air Force hydrocarbon fuels. Effects of sediment type, organic carbon content, pH, temperature, and salinity on interaction of dissolved hydrocarbons with sediment were studied. The results of this work can be used to estimate the rate of sediment-hydrocarbon interaction terms in fate models of aqueous systems.

**DESCRIPTORS (U)** \*Jet engine fuels. \*Hydrocarbons. \*Adsorption. \*Sediments. \*Chemical analysis. Adsorbents. Clay. Distilled water. Salt water. Solutions (Mixtures). Chemical composition. Carbon. pH factor. Temperature. Salinity. Equilibrium (General). Constants. Solubility. Environmental impact.

**IDENTIFIERS (U)** PB82801F WUAFESC19002028

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A117 875 6/8 21/4  
ENGINEERING-SCIENCE INC ARCADIA CALIF  
(U) Vapor Condensation Control of JP-4 Emissions from  
Underground Storage Tanks at March Air Force Base,  
California

DESCRIPTIVE NOTE Final rept Sep-Oct 81.

MAY 82 38P

PERSONAL AUTHORS Holtz, Donald P , Cottone, Lawrence C .  
CONTRACT NO F33615-80-D-4001  
PROJECT NO 1800  
TASK NO 70  
MONITOR AFESC/ESL  
TR-82-01

## UNCLASSIFIED REPORT

ABSTRACT (U) Three efficiency test runs were conducted on an Edvard Engineering Corporation Hydrocarbon Vapor Recovery Unit Model DE 1000 at the March Air Force Base. The recovery unit was installed at the March Air Force Base on 22 and 23 September and 1 October 1981. The recovery system was installed to control JP-4 vapors displaced from the filling of underground tanks. The purpose of the test was to assess the compliance with South Coast Air Quality Management District Rule 402 specifying minimum efficiencies for vapor condensation systems. (Author)

DESCRIPTORS (U) \*AIR pollution \*AIR pollution control equipment, \*Jet engine fuels, \*Jet storage tanks, \*Vapor deposition, \*Emission control, \*Underground facilities, \*Storage tanks, \*Condensation, \*Recovery, \*Methodology, \*Performance Engineering.

IDENTIFIERS (U) JP-4 fuel, Hydrocarbon fuels, PEB2801F, WUAFESC18007002

AD-A117 875

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## SEARCH CONTROL NO 095028

AD-A117 587 1/5 19/4 15/7

BDM CORP MCLEAN VA

(U) The Study of Foreign Object Damage Caused by Aircraft Operations on Unconventional and Bomb-Damaged Airfield Surfaces

DESCRIPTIVE NOTE Final rept Sep 80-Jun 81.

JUN 81 172P

PERSONAL AUTHORS Beatty D N , Readdy, F , Gearhart, J J , Duchastellier, R ,

REPORT NO BDM/W-81-029-TR

CONTRACT NO F08835-80-C-0208

PROJECT NO 2104

TASK NO 2B

MONITOR AFESC/ESL  
TR-81-38

## UNCLASSIFIED REPORT

ABSTRACT (U) This technical report documents the results of analyses conducted to assess the current level of technology available to determine the probability and extent of FOD to aircraft operating from conventional and bomb-damaged airfield surfaces. The various mechanisms (1) jet blast, tire/ground interaction, (2) which can create particles which can then cause damage and the level of susceptibility of various aircraft to damage are considered. Engine and airframe vulnerability to FOD is assessed and FOD prevention techniques currently being used are evaluated. The analysis concludes that the current level of technology only permits a qualitative understanding of FOD potential. The report identifies the information and data necessary to develop a quantitative relationship between debris characteristics and the extent of damage. In addition, a testing program is recommended to establish the quantitative relationship and to permit the development of a predictive methodology. (Author)

DESCRIPTORS (U) \*Landing fields, \*Runways, \*Operational readiness, \*Bomb damage \*Debris, Aircraft landings.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 054026

AD-A117 084 10/1

ULTRASYS/STMS INC FAIRFAX VA

(U) Advanced Bio-Energy Systems for Air Force  
Institutions

DESCRIPTIVE NOTE Final rept Feb 80-Jan 81.

OCT 81 100P

PERSONAL AUTHORS Huff, William J , Bond, Desmond H ,

CONTRACT NO DACA31-80-D-0020

PROJECT NO 2054

TASK NO 50

MONITOR FEGA-T, AFSC/ESL  
2110, \*R-81-11

UNCLASSIFIED REPORT

Availability Document partially illegible

**ABSTRACT (U)** This investigation was sponsored by the US Air Force to determine the potential of using innovative biomass energy conversion technology to interface with, improve energy generating hardware to sustain total, annual energy energy requirements, and to provide a high level of flexibility in the use of the technology. The high potential for such a system is that certain, elements and subcycles require a test evaluation and demonstration in an Air Force base environment before full implementation is possible. The investigation found that a biomass energy island system could be achieved through a centralized biomass gasification/combined cycle system to produce 135,000 lb/hr 150 psig steam (saturated) and 27 Mwh/hr electrical power from 1480 green tons of wood chips daily. A phased implementation system is recommended, consisting of separate integrable test and evaluation modules for combined cycle wood gasification and for cogeneration which would dovetail into an expanded baseload energy self-sufficient system. The investigation did not consider harvestation or base woodlands, which is the subject of a separate effort to define the wood resource aspects of a total biomass self-sufficient system (Author)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A110 455 1/5 1/3

OAK RIDGE NATIONAL LAB TN

(U) Krypton-85 Powered Lights for Airfield Application

DESCRIPTIVE NOTE Final rept Oct 70-Sep 80.

NOV 81 24P

PERSONAL AUTHORS Goss, F. Neil; Hauff, Karl W.

PROJECT NO 2103

TASK NO 80

MONITOR AFSC/ESL  
TR-80-85

## UNCLASSIFIED REPORT

**ABSTRACT** (U) Airfield lighting is complex in its requirements for lights of various intensities and colors. Some applications such as taxiway lights, information lights, and obstacle lights may be served by lights of relatively low intensity. They should meet criteria such as energy efficiency, little or no dependence upon batteries or generators, low maintenance, and rapid deployment. Lights powered with krypton-85 provide some of these advantages. This report summarizes an effort to develop krypton-85 powered airfield lighting. Light produced when beta rays from krypton-85 excite phosphor phosphors selected produced blue, red, and green light. Field testing of the lights was sufficiently encouraging to continue development in a follow-on effort (Author)

**DESCRIPTORS** (U) Airports, Landing lights, Krypton, Lighting equipment, Landing fields, Field tests, Colors, Phosphors, Electric batteries, Energy conservation, Low intensity, Efficiency

**IDENTIFIERS** (U) Krypton powered lights, PB83723F  
UNAFESC21038013

AD A110 455

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AD A110 347

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AIR FORCE ACADEMY CO

(U) United States Air Force Academy (USAF/A) Vertical Axis  
Wind Turbine

DESCRIPTIVE NOTE Final rept May 77-Sep 80.

SEP 80 78P

PERSONAL AUTHORS Kuligren, Thomas E.; Wiedeweyer, Dennis W.

PROJECT NO 2103

TASK NO 80

MONITOR AFSC/ESL  
TR-80-48

## UNCLASSIFIED REPORT

**ABSTRACT** (U) This report describes the design, fabrication, installation and testing of a small variable-speed vertical axis wind turbine (VAVT). This VAVT is unique in its installation using hand tools only, its operational and simple support system, and variable speed operation under microprocessor control. Initial testing confirmed that the turbine can be controlled by a command alternator field modulation. Further studies will be directed toward determination of an optimum control algorithm.

**DESCRIPTORS** (U) Wind, Energy conversion, Turbines, Fabrication, Installation, Towers, Test methods, Microprocessors, Control systems, Algorithms, Vertical orientation

**IDENTIFIERS** (U) VAVT (Vertical Axis Wind Turbines) Wind turbines, Variable speed operation, Vertical axis wind turbines, UNAFESC21038007, PB84708F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A115 946 21/4 7/4  
SRI INTERNATIONAL MEMO PARK CA

(U) Analysis and Environmental Fate of Air Force

Distillate and High Density Fuels

DESCRIPTIVE NOTE Final Rpt Aug 80-Oct 81,

DCT 81 155P

PERSONAL AUTHORS Smith, J H , Harper J C , Jaber, M .

CONTRACT NO F08935-80-C-0123

PROJECT NO 1900

TASK NO 20

MONITOR AFESC/EEL  
TR-81-51

## UNCLASSIFIED REPORT

**ABSTRACT** (U) Five high density fuels (JP-4, JP-5, JP-8, JP-9, and JP-10) and three distillate fuels (BU-4, RD 5, RD-8, and RD-10) were analyzed by capillary column gas chromatography (GC) and mass spectrometry (MS). The major components of the distillate fuels were identified by gas chromatography-mass spectrometry (GC-MS). The molecular weight of the isomers of the high density fuel components were also determined, but the structures of only a few components were assigned by comparing the GC retention times with authentic samples. The concentration and identity of the major water-soluble fuel components were also identified. The volatilization rates of the water-soluble components of JP-4, JP-8, and JP-9 were measured by preparing solutions of the fuel components in water, stirring at three different rates, and measuring the rate of decrease of the concentration of each component by GC as a function of time. The water-soluble components of JP-4 were photolyzed for 21 days under sunlight in deionized water, natural seawater, and water from a local pond. The distribution of the fuel components was estimated, using the method recently proposed by Mackay and Paterson. The alkanes should partition almost entirely into the atmosphere, the monoaromatics should be in both the air and water, and the naphthalenes should partition into the water and the sediment phases. Adsorption of the alkanes and monoaromatics should not be a major environmental fate. It is recommended that the rate of dissolution in

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cruise-missile fuels JP-10, RU 4, and RU-5 exhibit still lower reactivities under the meteorological conditions encountered during this study, the same general conditionality ranking was observed for multi-day irradiation with no further modification of the results. All of the military fuels studied (the both kerosene-derived and high-energy) had similar maximum ozone-forming potentials.

DESCRIPTORS: (U) Atmospheric chemistry, Jet engine fuels, Autocative fuels, Diesel fuels, Air quality, Hydrocarbons, Aviation fuels, Oil shales, Fuel additives, Gasoline, Reaction kinetics, Ozone, Reactivities, Nitrogen oxides, Oxidation, Aerosols, Simulation, Environmental impact, Test methods, Chambers, Tables(Data)

IDENTIFIERS (U) WUAFESC19002020, PE02601F

AU-A115 443 201/5 21/2 21/3

MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB

(U) Remote Sensing of Turbine Engine Gases

DESCRIPTIVE NOTE Final rept 1 Oct 80-30 Sep 81.

SEP 81 81P

PERSONAL AUTHORS Killinger, Dennis K ,Menyuk, Norman , Moradian, Aram ,

CONTRACT NO F19828-80-C-0002

PROJECT NO 1300

TASK NO 20

MONITOR ESD AFESC/LSL

TR-82-014, TR-82-018

UNCLASSIFIED REPORT

ABSTRACT (U) This is the FY 81 final report on the program entitled 'Remote Sensing of Turbine Engine Gases'. The specific tasks which were conducted during FY 81 consisted of the following: (1) the feasibility demonstration of a dual-laser differential-absorption LIDAR(DIAL) system for the remote sensing of CO, NO, and C2H4; (2) the development of a data acquisition and processing system for the dual-laser DIAL system; (3) the feasibility study of CO and C2H4 in the exhaust of a stationary jet aircraft; and (4) the laser remote sensing of hydrazine, monomethylhydrazine (MMH), and unsymmetrical dimethylhydrazine (UDMH).

DESCRIPTORS: (U) Laser, Remote detectors, Exhaust gases, Gas turbines, Jet engines, Dual mode, Methylhydrazines, Carbon monoxide, Dimethylhydrazines, Data acquisition, Feasibility studies, Data processing, Jet aircraft, Stationary

IDENTIFIERS (U) Dual laser, WUAFESC19002023, PE02601F

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SEARCH CONTROL NO 055022

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AIA FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Evaluation of Dual Drum Vibratory Rollers for Rapid  
Runway Repair

(U) Development of a Pavement Maintenance Management  
System Volume VIII Development of an Airfield  
Pavement Maintenance and Repair Consequence System

DESCRIPTIVE NOTE Final rept Aug-Nov 80.

DESCRIPTIVE NOTE Final rept Jan 80-Apr 81.

MAR 81 45P

APR 81 30P

PERSONAL AUTHORS Alexander, Edgar F., Grabin, R. William.

PERSONAL AUTHORS Shepley, M. Y., Kohn, S. D., Lytton, R. L.,  
Jepel, E.

REPORT NO AFESL/ESL 74-82-38

PROJECT NO 2821

REPORT NO AFESL/ESL TR-C1-19-VOL-8

TASK NO 20

PROJECT NO 2054

UNCLASSIFIED REPORT

TASK NO 4P

UNCLASSIFIED REPORT

ABSTRACT (U) Two dual drum vibratory rollers were  
evaluated and compared to the standard Air Force single  
drum roller. The rollers were evaluated for their ability  
to compact graded crushed limestone and their ability to  
reduce the time required to compact crushed limestone for  
use in runway repair. Repair determined that an equal weight dual-  
drum roller can compact limestone as well as the present  
Air Force single drum roller and do the job in 50% less  
time (Author)

DESCRIPTORS (U) \*Rollers, Runways, Bomb damage, Graters,  
Repair, Quick reaction, Rock, Compacting, Road building  
equipment, Vibrators (Mechanical), Field tests

IDENTIFIERS (U) Bomb damage repair, Crushed stone,  
\*Road rollers, FEB4708F, WUAFESL28122008

ABSTRACT (U) This report documents development of the  
Airfield Pavement Management System (APMS). A  
computerized system for analyzing airfield pavements. The  
system provides (1) a method for determining feasible  
maintenance and repair (MAR) alternatives for a given  
pavement feature, (2) a procedure for performing economic  
analyses to compare various MAR alternatives for a given  
pavement feature and (3) a procedure for forecasting the  
pavement condition index and key distresses as a  
consequence of applying a MAR alternative to a  
particular pavement feature. APMS now consists of seven  
modules assigned to (1) perform evaluation summary (2)  
perform localized repair analysis, (3) evaluate the  
consequences of localized repair, (4) evaluate the  
consequences of other MAR (5) perform cost analysis, (6)  
perform benefit analysis, and (7) perform budget  
optimization (Author)

DESCRIPTORS (U) \*Pavements, Maintenance management  
including fields, Maintenance, Repair, Costs, Benefits  
Military buildings, Computer applications, Modular  
construction

IDENTIFIERS (U) \*APMS (Airfield Pavement Management  
System) FEB4708F WUAFESL20544P25

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AD-A114 556 1/5 NTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB  
 (U) Tasking of Tritium-Powered Runway Distance and Inlay  
 Markers  
 DESCRIPTIVE NOTE Final Rept Oct 80-Aug 81.  
 AUG 81 28P  
 PERSONAL AUTHORS Haff, K W, Gase, F P, Tompkins, J A,  
 SCHULTZ, F L,  
 REPORT NO AFESC/ESL-TR-81-45  
 PROJECT N° 1ECS  
 TASK NO DF

AD A114 380 13/2 5/9 13/12  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB  
 (U) Smoke Abatement System for Crash Rescue/Fire Training  
 Facilities  
 DESCRIPTIVE NOTE Final rept Sep -Sep 81.  
 SEP 81 3JP  
 PERSONAL AUTHORS Kuan, Anthony J, Hamer, John A,  
 REPORT NO AFESC-TR-81-43  
 PROJECT NO 2905  
 TASK NO 20

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) The Isotope Technology Group of the Oak Ridge National Laboratory's Radiosotopes Department was asked by the U.S. Air Force to test tritium-powered runway distance and tailway marker signs. The tests were conducted in accordance with the U.S. Air Force and Oak Ridge National Laboratory and were designed to test the serviceability of these signs under adverse weather and handling conditions, determine their limiting factors, and determine their service life. The testing program and results indicate that the signs will exceed service life and durability requirements for their intended program. This report is a discussion of the testing program and the results of these tests. (Author)

DESCRIPTORS (U) Runways, Taxiways, Trillium, Markers, Adverse conditions, Weather, Handling, Air Force, Life expectancy, Limitations, Power, Distance measuring equipment.

IDENTIFIERS (U) Trillium powered runways, Distance markers, WAFESCFCSD702, PE7289F

ABSTRACT (U) This report provides the design for a smoke abatement aircraft crash/rescue trainer. The design is for a 15-ft diameter fire area suitable for operation in freezing and nonfreezing climates. With this system liquid petroleum fuels can be burned with little or no smoke by injecting a fine water spray near the surface of the burning fuel. This method of smoke abatement is being applied at military fire fighting training facilities. The report includes all equipment necessary for the smoke abatement function and provides detailed step-by-step operating procedures. (Author)

DESCRIPTORS (U) Smoke abatement, Air pollution, Training devices, Fire fighting, Aircraft fires, Aviation accidents, Crashes, Rescue, Fire suppression, Smoke, Water injection, Sprays, Cost effect/means

IDENTIFIERS (U) PEG4708F, WAFZSC25052033

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AD A114 JRO

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AD A113 811 14/2 1-75 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 095028  
 FLORIDA UNIV GAINESVILLE DEPT OF ENVIRONMENTAL  
 ENGINEERING SCIENCES AC A113 811 CONTINUED  
 PE82301F, WUAFESCE1 16J02052

(U) Field Test of an In-Stack Diffusion Classifier on an  
 Aircraft Engine Test Cell

DESCRIPTIVE NOTE Final report Jun-Dec 80.

APR 81 4QP

PERSONAL AUTHORS Lundgren, Dale A .Husknacht, Brian J .  
 CONTRACT NO EPA-R-809-702-02-2

PROJECT NO 1900

TASK NO 20

MONITOR AFSC/ESL  
 TR-87-21

UNCLASSIFIED REPORT

ABSTRACT (U) An in stack diffusion classifier was field tested at Tyndall Air Force Base, Florida. Particle size distribution measurements were made on the exhaust stream from the engine test cell while running a J75-P17 jet engine. Samples were collected at the test cell exhaust plane using a University of Washington in-stack cascade classifier followed, in series, by an in-stack diffusion classifier being developed at University of Florida. In addition, total particulate samples were obtained using absolute filters to determine particulate mass concentration in the exhaust gases. Opacity readings of the plume were obtained during sampling. The procedures to pilot scale impactor cascade classifier, probes encountered to generate reasonable estimate of jet exhaust aerosol size distribution using a diffusion classifier are described in this report. (Author)

DESCRIPTORS (U) \*Test equipment, \*Jet engines, \*Exhaust plumes, \*Particle size, \*Measurement, \*Sampling, Impact, Cascade structures, Collecting methods, Diffusion, Filters, Particulates, Exhaust gases, Aerosols, Field tests

IDENTIFIERS (U) In stack diffusion classifiers, J 75 engines Cascade impactors Diffusion classifiers.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A113 771 CONTINUED

UNAFESCSL21032A50

AD-A113 771 14/2 13/2

FLORIDA UNIV GAINESVILLE DEPT OF ENVIRONMENTAL  
ENGINEERING SCIENCES(U) An 'In-Stack' Diffusion Classifier for Aerosol Mass  
Distribution Measurement

DESCRIPTIVE NOTE Final rept. Jun 78-Jun 80.

APR 81 38P

PERSONAL AUTHORS Lindgren, Dale A , Rangaraj, Cumbum N .

CONTRACT NO EPA-R-005782-010

PROJECT NO 2103

TASK NO 2A

MONITOR AFSC/ESL  
TR-81-04

## UNCLASSIFIED REPORT

ABSTRACT. (U) A five-stage, screen-type diffusion classifier was designed and built to make in-situ measurement of submicron aerosols at temperatures and pressures encountered in industrial-type combustion stacks. Laboratory calibration proceeded satisfactorily and no strong problems were encountered in test procedures during both field tests (at the Jacksonville Florida Electric Authority (JEA)) Southside Generating Station, Unit 4 (oil-fired boiler) and the Ne Al Air Rework Facility, Jacksonville, Jet Engine test Cell 11 (J-52 engines). Conditioning of the glass fiber filters to sulfur oxides was not done at the Southside Power Plant. This appears to have been the major problem here. Temperatures of the exhaust stack exceeded 200 C at the Jet Engine test Cell. Consequent weight loss due to grease vaporization appears to have been the problem there (with).

DESCRIPTORS (U) Test equipment, Measurement, Aerosols, Air pollution, Smoke stacks, Diffusion, Sampling, Classification, Industrial plants, Smoke, Field tests, Particle size

IDENTIFIERS (U) In stack diffusion classifiers, Mass distribution, Submicron aerosols, PC83713F.

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AD-A113 008 4/1 21/4 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 050028  
AD A113 008 CONTINUED

CALIFORNIA UNIV RIVERSIDE STATEWIDE AIR POLLUTION  
RESEARCH CENTER

(U) Atmospheric Chemistry of Hydrocarbon Fuels Volume II  
Outdoor Chamber Data Tabulations Part II

IDENTIFIERS (U) PE02NO1F, WUAFSC19002020

DESCRIPTIVE NOTE Final rept Mar 80-Sep 81.

NOV 81 318P

PERSONAL AUTHORS Carter, William P L, Riple, Paul S,  
Smith, Cecil O, Pitts, James N, Jr.

CONTRACT NO F08035 80-C 9080

PROJECT NO 1200

TASK NO 20

MONITOR AFSC/ESL  
TR-81-53 V-2-F 2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, Part 1, AD-A113  
008

ABSTRACT (U) A total of 132 single- and multi-day outdoor environmental chamber experiments were conducted in this program involving nine different aviation and automotive fuels. These included the petroleum-derived JP 4 and JP-8 military aviation fuels, their shale-oil derived analogues, unleaded gasoline, diesel No 2 fuel, and the experimental high-energy cruise-miscile fuels JP-4, JP-8, and AD-5. The program was conducted to assess the potential of these fuels to adversely affect air quality. This report consists of two separately bound parts which contain the detailed data sheets for the outdoor chamber experiments. This is Part II of Volume II (Author).

DESCRIPTORS (U) Air quality, Atmospheric chemistry, Jet engine fuels, Automotive fuels, Diesel fuel, Tables (Data), Hydrocarbons, Aviation fuels, Shale fuel additives, Gasoline, Combustion products, Aerosols, Cruise missiles, Environmental impact, Ozone, Outdoor Simulation, Data processing, Experimental data

AD A113 008

AD A113 008

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AD-A113 085 4/1 21/4 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
AD-A113 085 CONTINUED

CALIFORNIA UNIV RIVERSIDE STATEWIDE AIR POLLUTION  
RESEARCH CENTER

(U) Atmospheric Chemistry of Hydrocarbon Fuels Volume II  
Outdoor Chamber Data Tabulations Part 1

IDENTIFIERS (U) JP-10 fuel, JP-8 fuel, RJ-4 fuel, RJ-5  
fuel, Unleaded gasoline, WJAF5C160020, P60201F

DESCRIPTIVE NOTE. Final rept Mar 80-Sep 81.

NOV 81 330P

PERSONAL AUTHORS Carter, William P L, Ripley, Paul S  
Smith, Cecil G, Pitts, James N, Jr.,

CONTRACT NO F08035-80-C-008

PROJECT NO 1200

TASK NO 20

MONITOR AFFSC/ESL  
IR-81-53-V-2-P-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, Part 2, AD-A113  
085

ABSTRACT (U) A total of 132 single and multi-day  
outdoor environmental chamber experiments were conducted  
in this program involving nine different aviation and  
automotive fuels. These included the petroleum-derived JP-  
4 and JP-8 military aviation fuels, their shale-oil  
derived analogues, unleaded gasoline, diesel No 2 fuel,  
and the experimental high-energy cruise-missile fuels JP-  
10, RJ-4, and RJ-8. The program was conducted to assess  
the potential of these fuels to adversely affect air  
quality. This is Volume II of the report due to printing  
limitations. Volume I consists of two separately bound  
parts which contain the detailed data sheets for the  
chamber experiments. This is Part I of Volume II  
(Author).

DESCRIPTORS (U) Air quality, Atmospheric chemistry,  
Jet engine fuels, Automotive fuels, Diesel fuels,  
Volatile organic compounds, Aviation fuels, Shale fuel  
additives, Gasoline, Combustion products, Cruise missiles,  
Aerosols, Environmental impact, Ozone, Outdoor  
Simulation, Data processing, Experimental data.

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## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A113 588 1/5

BATTILLE COLUMBUS LABS OH

(U) BDR Tensile Structure Concept Feasibility Study

DESCRIPTIVE NOTE Final rept Mar-Jul 80.

AUG 80 48P

PERSONAL AUTHORS Kuznetsov, Edward M.

CONTRACT NO 108036-80-C-0109

PROJECT NO 2104

TASK NO 2B

MONITOR ACFSC/EST  
TR-80-82

UNCLASSIFIED REPORT

ABSTRACT (U) This report discusses the feasibility of using a thin-sheet membrane as a bridge across a bomb crater in a runway. The first step of the study was to determine the tension in a membrane required to support an F-4E aircraft. Once the tension forces, membrane thickness was determined, the next step was to determine a feasible system for anchoring the membrane to pavement surrounding the crater. The final part of the study was discussion on membrane fabrication, handling, and installation procedures. (Author)

DESCRIPTORS (U) \*Runways, \*Repair, \*Bomb damage, \*Craters, Pavements, Membranes, Sheets, Thermal stresses, Anchors (Structural), Strain hardening, Tension, Feasibility studies

IDENTIFIERS (U) F-4E aircraft WJAFSC21042050  
#683723P

AD-A113 588

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AD A113 527

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AD A113 527 8/7 1/3

CIVIL ENGINEERING LAB (NAVY) PORT HUENEME CA

(U) Permeability and Strength Characteristics of Graded Crushed Stone for Use in Rapid Runway Repair

DESCRIPTIVE NOTE Final rept Jan-Sep 80.

SEP 80 74P

PERSONAL AUTHORS Wu, G Y.

CONTRACT NO WJPR-S-80 12

PROJECT NO 2054

TASK NO 6B

MONITOR ESL  
TR-80-54

UNCLASSIFIED REPORT

ABSTRACT (U) The permeability and strength characteristics of six gradations of crushed limestone were evaluated in the laboratory to identify a gradation of crushed limestone that is stronger than the 1/2 gradation. Based on limited laboratory tests, pore pressure buildup did not seem to be a significant problem associated with the crushed limestone. The frictional strength criterion is not suitable for this crushed limestone because the friction angles obtained from undrained triaxial tests may not be valid within the range of confining pressures. With the assumption that strength of confining pressure is more important than at high confining pressure, the cohesion criterion was selected for analysis. Field traffic tests are needed to validate the assumption. (Author)

DESCRIPTORS (U) \*Limestone, \*Runways, \*Repair, Pavements, Permeability, Shear strength, Physical properties, Pore pressure, Friction, Cohesion, Crushing, Quick reaction, Modulus of elasticity, Computerized simulation, Airports, Field tests, Laboratory tests, Poisson ratio, Finite element analysis

IDENTIFIERS (U) PEG4708F WJFSL20546817



## UNCLASSIFIED

AD-A111 493 1/5 13/2 1/3 DTIC REPORT EIRLQGR-PHY SEARCH CONTROL NO 055028  
 AIR FORCE ENGINEERING AND SERVICE CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB  
 (U) Proposed Specifications for International  
 Interoperability on Repaired Bomb Damaged Runways  
 DESCRIPTIVE NOTE Final rept Jun 80 Jan 81.  
 JAN 81 68P  
 PERSONAL AUTHORS Caldwell, Lapsley R , Gerard, Anthony G  
 REPORT NO AFESC-SSL , R-81-03  
 PROJECT NO 2104  
 TASK NO 28  
 MONITOR AFESC/ESL  
 TR-81-18  
 PERSONAL AUTHOR Jablonski, Edwin J .  
 PROJECT NO 2503  
 TASK NO 10  
 MONITOR AFESC/ESL  
 TR-81-18  
 DESCRIPTIVE NOTE Final rept Sep 78-MAY 80.  
 APR 81 45P  
 NAVAL RESEARCH LAB WASHINGTON DC  
 (U) Evaluation of Three Percent Aqueous Film Forming Foam  
 (AFF) Concentrates as Fire Fighting Agents

## UNCLASSIFIED REPORT

ABSTRACT (U) This paper suggests definitions for data, data formats, and National responsibilities for data, development of war emergency airfield pavement repair specifications. An airfield manager would use these specifications to make repairs after an enemy attack. Minimum Operating Strip Size, repair quality, repair spacing, and other parameters are specified. If the repair specifications for a specific aircraft can not be met, then discrepancies can be identified and the aircraft operator could assess the additional risk. Exchange of these specifications between the nation operating an aircraft and the nation managing an airfield would enhance NATO interoperability. (Author)

DESCRIPTORS (U) Runways, Western Europe, Military Facilities, Operation, Military Requirements, Bomb Damage, Repair, Taxiways, Jet Fighters, Specifications, International

IDENTIFIERS (U) F-4E aircraft, WUESL21042841, PE63723F

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AD A110 821

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055028

ABSTRACT (U) A large-scale fire test program involving 20,000-square foot JP 4 fuel fires was conducted to evaluate the fire suppression effectiveness and combustibility of 3 percent Aqueous Film Forming Foam (AFF) agents in Air Force fire fighting vehicles. Three commercially available 3 percent AFF concentrates were tested in accordance with military specification MIL-F-24385B. Test results are summarized in Appendix A. As a result of these tests, an updated Revision C to the MIL SPEC has been accomplished with new requirements for both 3 percent and 6 percent AFF extinguishing agents. (Author)

## UNCLASSIFIED REPORT

DESCRIPTORS (U) Fire extinguishing agents, Fire suppression, Nozzles, Foam, Foaming inhibitors, Military requirements, Specifications, test and evaluation Concentration (Chemistry), Military vehicles, Fire fighting vehicles

IDENTIFIERS (U) Fuel fires, Air force fire fighting vehicles, AFF (Aqueous Film Forming Foam), WUAFESC25051010, PTG4708F

## UNCLASSIFIED

AD-A110 758 0/8 13/2 20/4 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB  
 (U) The Biological Degradation of Spilled Jet Fuels A  
 Literature Review  
 DESCRIPTIVE NOTE Final rept Jun Aug 81.  
 OCT 81 41P  
 PERSONAL AUTHORS Carlson, Robert E.  
 REPORT NO AFESC/ZSL-TR-81-50  
 PROJECT NO 1900  
 TASK NO 20

## UNCLASSIFIED REPORT

ABSTRACT. (U) Biodegradation of many of the components of Air Force fuels does occur, although most studies have been done under laboratory conditions, and the extrapolation of the findings to natural sites of biodegradation is premature. Factors affecting biodegradation rates, including the nature and concentration of specific hydrocarbon compound, the species and factors present and their quantity, and environmental factors such as nutrient availability, temperature and oxygen concentration. Initial concerns should be first the determination of the importance of biodegradation relative to other loss factors such as volatilization and sediment sorption, and second, the determination of the ultimate fate of recalcitrant compounds and their metabolites (Author)

DESCRIPTORS. (U) Biodegradation, Jet engine fuels, Water pollution, Microorganisms, Bacteria, Decomposition, Hydrocarbons, Metabolism, Rates, Toxicity, Ecosystems, Pollutants, Spilling, Concentration(Composition), Cultures(Biology), Aquatic organisms, Water pollution abatement

IDENTIFIERS (U) JP-4 fuel, WJAFESC19C02034, PEB2801F

AD-A110 758

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AD-A110 972

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## UNCLASSIFIED REPORT

ABSTRACT (U) A nonlinear, finite-element computer code was developed for use in predicting the performance of repaired bomb craters. The code is capable of calculating the stresses, strains, and deflections produced by the stresses and multiple-wheel aircraft gear configurations. The apparent crater profile can be input as a series of linear approximations that is used in the code to modify material properties to reflect feedback and fallback crater debris from in situ native materials (Author)

DESCRIPTORS (U) Craters, Bomb damage, Pavements, Repair, Profiles, Debris, Landing gear, Stressors, Soil(Mechanics), Deflection, Mathematical prediction, Finite element analysis, Computerized simulation, Computer programs

IDENTIFIERS (U) Bomb damage repair, WJAFESC1042B47, PEB3723F



## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055078

AD A110 035 13/2 21/9

ENGINEERING-SCIENCE CD NUCLEAR VA

(U) Air Pollution Testing of Hypergolic Fuel Vapor Scrubbers at Cape Canaveral Air Force Station Florida

DESCRIPTIVE NOTE Final rept Jul-Nov 80.

OCT 81 52P

PERSONAL AUTHORS Felts W Keith

REPORT NO 3725 00/20

CONTRACT NO F30815 80-7-4001

PROJECT NO 1900

TASK NO 70

MONITOR AFES/ESL  
TR-PJ-58

UNCLASSIFIED REPORT

ABSTRACT (U) Hypergolic fuel and oxidizer scrubbers were studied to determine emission products produced during actual hypergol transfers. A scrubber system was used in the fuel scrubber was 5 percent citric acid and the scrubber liquor in oxidizer scrubber was 5 percent NaOH. 12 percent Na2SO3 (Author)

DESCRIPTORS (U) \*Scrubbers, \*Hypergolic fuels, \*Air pollution, \*Pollution abatement, \*Emission control, \*Vapors, \*Methyl hydrazines, \*Nitrogen oxides, \*Rocket fuels, \*Test methods, \*Transfer, \*Storage tanks, \*Concentration (Composition), \*Sampling, \*Chemical analysis, \*Efficiency

IDENTIFIERS (U) MUAFESC19007002, PEU2801F

AD A110 035

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AD A110 305 1/3 21/4

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) The Effect of Fuel Composition on Groundfall from Aircraft Fuel Jettisoning

DESCRIPTIVE NOTE Final rept Mar 80-Feb 81.

MAR 81 35P

PERSONAL AUTHORS Clewell, Harvey J . III.

REPORT NO AFESC/ESL-TR-81-13

PROJECT NO 1900

TASK NO 4C

UNCLASSIFIED REPORT

ABSTRACT (U) A computer model which simulates the evaporation and free-fall of fuel droplets in the atmosphere was used to determine the effect of fuel composition on the nature and extent of ground contamination by fuel discharged from an aircraft in flight. Three fuel compositions were used: (1) JP-4 the standard Air Force Jet fuel, (2) Jet A (JP 8), the standard U S commercial jet fuel, and (3) Number 2 Diesel fuel, representing the upper limit for future, broadened-specification fuels from alternative sources. The results of this study indicate that the amount of liquid fuel reaching the ground from the jettisoning of commercial jet fuels is much greater than for JP-4. Moreover, future broadened-specification fuels may produce even greater ground contamination when jettisoned.

DESCRIPTORS (U) \*Aircraft, \*Jet engine fuels, \*Contaminable equipment, \*Commercial equipment, \*Computerized simulation, \*Chemical composition, \*Contamination, \*Ground level, \*Diesel fuels, \*Evaporation, \*Free fall models, \*Specifications, \*Limitations, \*Fission, \*Environments, \*Hydrocarbons

IDENTIFIERS (U) Computer models, Fuel Amping  
MUAFESC19004C02, PCB281F

AD A110 305

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A110 208 13/2

AD-A109 307 21/4 4/1 1/3

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN IL

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Pavement Maintenance Management: for Roads and Parking Lots

(U) Evaporation and Groundfall: of JP-4 Jet Fuel Jettisoned  
by USAR Aircraft

DESCRIPTIVE NOTE Final rept Oct 78-Dec 79.

DESCRIPTIVE NOTE Final rept Feb 72-Jun 80.

OCT 81 223P

SEP 80 131P

PERSONAL AUTHORS Shahn, Mohamed V , Kohn, Starr U

PERSONAL AUTHORS Clewell, Harvey J , III ,

REPORT NO CERL-TR-M-224

REPORT NO AFESC/ESL-TR-80-98

PROJECT NO 4A782721AT41, 208A

PROJECT NO 1900

TASK NO D, 4P

TASK NO 4C

MONITOR AFESC/ESL  
TR-80-53

UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes PAVER, a field-tested, rationalized pavement maintenance management system for airfield pavements which is designed to optimize the allocation of resources for pavement maintenance and rehabilitation (MAR) (Author)

ABSTRACT (U) An experimental and modeling effort was undertaken to determine the physical fate of JP-4 jet fuel discharged from an aircraft in flight. A computer model was developed to simulate evaporation and free-fall of fuel droplets in the atmosphere. In order to apply this model to jettisoned fuel, an experimental study was performed to determine the droplet size distribution produced by the jettisoning process. This study featured in-flight sampling of the fuel plume from a KC-135 tanker aircraft. Sampling was also performed at ground level to determine whether the jettisoned fuel reached the ground in significant concentrations for fuel jettisoning as low as 750 meters above the ground at temperatures around 11 C. no liquid fuel could be detected by ground observers and no significant hydrocarbon concentrations (greater than a few ppm C) were measured by the sampling

DESCRIPTORS (U) Pavements, Maintenance management, Military facilities, Roads, Surveys, Ratings, Maintenance, Determination, Repair, Economic analysis, Data management, Manual operation, Computer applications

IDENTIFIERS (U) Parking facilities, PAVER management system, WU040 PE02721A, AST41

DESCRIPTORS (U) Jet engine fuels, Jettisonable equipment, Drops, Evaporation, Distribution, Particle size, Tanker aircraft, Experimental data, Dimensions, Computerized simulation, Flight, Ground level, Sampling Hydrocarbons, Vapors

IDENTIFIERS (U) JP-4 fuel, KC-135 aircraft, Fuel jettisoning, Groundfall, Fuel dumping, PE62801F WUAFESC19004C02

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NYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO US4028

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Pavement bases, Infrared photography

NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE

IDENTIFIERS (U) WJAFESC21042824, PB03723F

(U) Repl's Damage Assessment Volume 1 Methodology for  
Selecting Repair Area of Ordnance-Damaged Pavements

DESCRIPTIVE NOTE Final rept 1 Jun 77-31 Aug 76

SEP 80 121P

PERSONAL AUTHORS Wilson Christopher W Williams, Neil D

REPORT NO NMRI-AP-28-VOL-1

CONTRACT NO F28801-76 C-0015

PROJECT NO 2104

TASK NO 28

MONITOR AFESC/ESL  
TR-60-67-VOL-1

UNCLASSIFIED REPORT

**ABSTRACT** (U) This report introduces and provides detailed information on four damage assessment and data reduction systems. The functions of these systems are to locate and assess the magnitude and location of the damage sustained by an airbase pavement during an attack using conventional weaponry and to select the section of the runway requiring the least amount of repair time to make operational. The primary system utilizes a linear photodiode array camera (1728 elements) to scan the runway and a microcomputer and video processing equipment to reduce the data and select the repair area. Three backup systems are recommended which require more time to assess the damage and reduce the data. Recommendations are made by the New Mexico Engineering Research Institute (NMERI) on the development of the four systems. This report is Volume 1 of two volumes (Author).

**DESCRIPTORS** (U) Runways, Damage assessment, Bomb damage Craters, Video mapping, Image processing, Linear arrays Photodiodes, Electronic scanners, Video signals Display systems, Microcomputers, Data processing, Data reduction, Aerial reconnaissance, Photogrammetry, Quick reaction, Repair, Aerial cameras, Site selection

AD-A108 288

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## DTIC REPORT BIBLIOGRAPHY

AD-A108 180 11/7 5/2

NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE

(U) Asphalt Recycling Technology Literature Review and Research Plan

DESCRIPTIVE NOTE Final report 30 Sep 80 13 Apr 81,

MAY 31 1/2P

PERSONAL AUTHORS Newcomb, David F ; Epps, Jen A .

REPORT NO NMRI-5 18-AP-40

CONTRACT NO F2801-78-C-0015

PROJECT NO 2104

TASK NO 1A

MONITOR AFSC/ESL  
TR-81-42

## UNCLASSIFIED REPORT

**ABSTRACT (U)** A review of current technology for the rehabilitation and maintenance of pavement surfaces by recycling was conducted. While the primary concern was asphalt concrete recycling, a brief review of portland cement concrete recycling is included. Reports of cases involving recycling technology and lessons learned are reviewed. Recommendations are presented outlining research required to advance the state-of-the-art in a manner that will permit the U.S. Air Force to fully attain the benefits of recycling technology. (Author)

**DESCRIPTORS (U)** \*Asphalt, \*Recycled materials, \*Literature surveys, \*State of the art, Air Force, Concrete, Pavements, Surfaces, Planning, Research, Management, Benefits, Rehabilitation, Case studies, Experimental design, Administration

**IDENTIFIERS (U)** Pavement design, NMAFESC21041A02, PERJ7237

AC-A108 199

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AD A107 712

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SEARCH CONTROL NO 055C28

AD-A107 712 1/5

NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE

(U) Rapid Damage Assessment Volume II Development and Testing of Rapid Damage Assessment System

DESCRIPTIVE NOTE Final rep 14 Jun 79-30 Nov 80,

FEB 81 157P

PERSONAL AUTHORS Wilson, Christopher W .

REPORT NO NMRI-5 08-AP-39

CONTRACT NO F2801-78-C-0015

PROJECT NO 2104

TASK NO 2B

MONITOR AFSC/ESL  
TR-80-47-VOL-2

## UNCLASSIFIED REPORT

**ABSTRACT (U)** This report describes the damage assessment system for rapid runway repair developed for concept verification. In the damage assessment system, an airborne linear charged device array sensor and a noninteractive image processing system are used to locate, identify and classify damages. The repair area is selected by a microcomputer. Results of the testing, the tradeoff analysis, and the field demonstration are presented. Recommendations are made for the development of a prototype system. (Author)

**DESCRIPTORS (U)** \*Runways, \*Quick reaction, \*Repair, \*Damage assessment, \*Research management, Test methods, Trade off analysis, Prototypes, Field conditions, Demonstrations, Classification

**IDENTIFIERS (U)** NMAFESC21042B2, PERJ7237

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A107 877 1/5 20/11

ROSS ENGINEERING ASSOCIATES INC VALPARAISO FL

(U) FOD Cover Analysis for Rapid Runway Repair

DESCRIPTIVE NOTE Final rpt 30 Jun-30 Sep 60.

OCY 80 48P

PERSONAL AUTHORS Ross, C A .

CONTRACT NO F08035-80 M-0248

PROJECT NO 2054

TASK NO 8B

MONITOR AFSC/ESI  
TR-80-58

UNCLASSIFIED REPORT

ABSTRACT (U) This study is concerned with the response of FOD covers for rapid runway repair. The major portion of the work is in support of the North Field tests. In addition some new repair materials and methods are discussed (Author)

DESCRIPTORS (U) \*Runways, \*Quick reaction, \*Repair stress strains, \*Vibration, Field tests, Materials, Methodology, \*Coverings, Metals, High temperature, Concrete, Polymers, Flexible structures, Loads (Forces)

IDENTIFIERS (U) FOD covers, Post service tests, Jet blast analysis, WJAFESC0548818, PB84708F

AD A107 877

UNCLASSIFIED

AD A107 852 13/8

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Method and Technologies for Reducing the Generation of Metal-bearing Sludges at AFIC Industrial Waste Treatment Plants

DESCRIPTIVE NOTE Final rpt Jun 78-May 81.

AUG 81 138P

PERSONAL AUTHORS Wachinski, Anthony M .

REPORT NO AFSC/ESL-TR-81-29

PROJECT NO 2103

TASK NO 70

UNCLASSIFIED REPORT

ABSTRACT (U) At present, the Air Force provides maintenance for its inventory of aircraft and associated systems at five industrial-complexes called Air Logistic Centers (ALCs). Wastewaters generated at the ALCs are treated by industrial waste treatment plants located on site. The effluent is then discharged to a nearby stream or to a privately owned treatment works (POTW). During the period, 16 July 1979 to 3 May 1980, these facilities were surveyed for ways to reduce the volume of metal-bearing sludges generated by the industrial plants. The surveys showed that the volume of sludge could be significantly reduced by a coordinated program of wastewater reduction, plant chemical conservation, optimization of sludge settling and sludge dewatering. Analyses of sludges showed them to be nonhazardous by the EPA Toxicity Characterization Method. Data suggested that efforts to delist the sludges as nonhazardous were warranted. Also included are in-depth discussions of evaporation, ion exchange, and reverse osmosis and their application as recovery processes in Air Force electroplating operations (Author)

DESCRIPTORS (U) \*Industrial plants, \*Waste treatment \*Bearing, \*Metals, \*Processing, \*Sludge, Volume, \*Water Extraction, Toxic agents, Reverse osmosis, Waste water Optimization, Electroplating, Aircraft, Air force operations, Evaporation, Logistics, Ion exchange.

AD A107 852

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## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 085028

AD-A107 552 CONTINUED

Reduction(Chemistry)

IDENTIFIERS (U) NIAFESCJ1037005, PE63723F

AD-A104 447 13/2 11/2 11/0

TEXAS UNIV AT AUSTIN

(U) Methyl Methacrylate Polymer-Concrete for Bomb Damage Repair Phase I

DESCRIPTIVE NOTE Interim rept Mar 73-May 80.

JUN 80 85P

PERSONAL AUTHORS Fowler, David W , Paul, Donald R , McCullough, B F , Meyer, Alvin H .

CONTRACT NO F08835 79-C-0103

PROJECT NO 2104

TASK NO 20

MW110R AFSC/ESL  
7R-NO-28

## UNCLASSIFIED REPORT

ABSTRACT (U) Methyl methacrylate (MMA) polymer / concrete appears to be a material which can be successful, "used to rapidly bomb damaged runways. A research program is underway to develop monomer formulations, determine engineering design properties, develop repair procedures, conduct field tests, conduct analytical studies, and develop an implementation manual. Research in Phase I has emphasized materials characterization, development of preliminary repair procedures, and analytical and experimental behavior of repairs. Materials characterization studies have been conducted on monomer formulations and polymers under various mechanical properties conditions and of ambient temperatures. Possible solutions for reducing adverse effects on strength of polymer-concrete made with wet aggregate have been studied. The effect of MMA on bond to asphalt has been determined. The effect of aggregate size on mechanical properties has been investigated.

DESCRIPTORS (U) \*Concrete, \*Polymers, Runways, Bomb damage, Craters, Methacrylates, Methyl radicals, Monomers Repair

IDENTIFIERS (U) \*Polymer concrete, Bomb damage repair, Aggregates(Materials), Methyl methacrylate,

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AD-A107 552

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## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055020

AD-A104 447 CONTINUED

WUAFESC21042835, PG03723F

AD-A103 907 1/2 13/12

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB(U) Test and Evaluation of Commercially Available Halon  
1211 Hand Portable Fire Extinguishers for Use in  
Habitable and Cargo Compartments of USAF Aircraft

DESCRIPTIVE NOTE Final rept Aug 80 Feb 81.

MAY 81 109P

PERSONAL AUTHORS Walker, Joseph L. Vickers, Richard R.  
Kwan, Anthony J.

REPORT NO AFESC/ESL-TR-81-22

PROJECT NO 2505

TASK NO 10

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes the results of a test and evaluation program of commercially available, off-the-shelf Halon 1211 hand-portable fire extinguishers. The primary emphasis of the test program was aimed at establishing the flightworthiness/crashworthiness characteristics of candidate articles. Tests were also conducted to evaluate the test item's design features, function, operational capabilities and maintainability. Results of the test program will be used in developing procurement specifications for Halon 1211 first-aid hand-portable fire extinguishers for use on board USAF aircraft (author)

DESCRIPTORS (U) \*Fire extinguishers, \*Fire extinguishing agents, \*Test and evaluation, Military aircraft, Tetrafluoroethylene insulns, Commercial equipment, Procurement, Specifications, Maintainability portable equipment, Compartments, Cargo Humans Aviation safety

IDENTIFIERS (U) HALON-1211 PB84708F, WUAFESC25051013

AD-A104 447

AD A103 907

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## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A102 903 13/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

AD-A102 903 CONTINUED

IAC NO PL 040532

IAC DOCUMENT TYPE PLASTIC - MICROFICHE --

(U) Field Test of Expedient Pavement Repairs (Test Items

IAC SUBJECT TERMS P--(U) Polymer concrete, Repair,  
Runways, Airfields, Field repairs, Limestone, Pavements,  
Concrete, Fiber glass/polyester, Polyesters,  
Composites, Fiber glass/polyurethanes, Polyurethanes,  
Failure criteria, Moisture content, Damage,  
Formulations, ZZ Unlimited ;

DESCRIPTIVE NOTE: Final rept Jul 78-Sep 79.

NOV 80 112P

PERSONAL AUTHORS McMorney, Michael T.

REPORT NO AFESC/ESL-TR-80 51

PROJECT NO 2104

TASK NO 28

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Rept NO AFESC/ESL-TR-79 00  
dated Mar 80, AD-A084 778

ABSTRACT: (U) This report describes field tests of 19 expedient repair of bomb craters in runways. The test facility consisted of a concrete surface placed over a crushed limestone base which in turn lay over a weak clay subgrade. Three 20-foot by 20-foot square sections were left open in the concrete to serve as test pits. The test facility was so constructed to allow for simulation of small bomb craters in a typical North Atlantic Treaty Organization runway. The test materials were used to repair the 'craters' in the pavement upon completion of each repair. The resulting surface was tested with load carts constructed to give the same load that would be experienced from landing of a modern fighter aircraft or cargo aircraft. This report describes the result of each of the tests and identifies areas requiring further research. (Author)

DESCRIPTORS (U) Pavements, Repair, Runways, Concrete, Craters, Simulation, Pavement bases, Limestone, Polymers, Performance tests, Loads (forces), Failure (mechanics)

IDENTIFIERS (U) Expedient surfacing Polymer concrete  
MJAFFESC21042822 PE50723F

AD-A102 903

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A102 040 10/2 8/7

SANDIA NATIONAL LABS ALBUQUERQUE NM

(U) Geothermal Resource Verification for Air Force Bases.

JUN 81 53P

PERSONAL AUTHORS Grant, Philip R., Jr.

REPORT NO SAM081-7123

CONTRACT NO DE-AC04-78DP00760

PROJECT NO 2054

UNCLASSIFIED REPORT

**ABSTRACT** (U) Geothermal energy offers a potential alternative to oil and gas for supplying the stationary power requirements of military installations. However, because of the past dominance of oil and gas, procedures for estimating geothermal energy potential have not been well defined nor well tested. This report summarizes the various types of geothermal energy, reviews some legal uncertainties of the resource and then describes a methodology to evaluate geothermal resources for applications to U.S. Air Force bases. Estimates suggest that exploration costs will be \$50,000,000, which, if favorable, would lead to drilling a \$500,000 exploration well. Successful identification and development of a geothermal resource could provide all base, fixed system needs with an inexpensive, renewable energy source (Author)

**DESCRIPTORS** (U) \*Geothermy, \*Air Force facilities, Cost estimates, Geophysical prospecting, Drilling, Potential energy, Natural resources, Energy conversion, Energy consumption

**IDENTIFIERS** (U) Geothermal energy Renewable resources  
PEG4708F

AD-A102 040

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AD A102 048

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DYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A101 442 0/5

AD-A100 800 1/5 13/2

ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
NEUILLY-SUR-SEINE (FRANCE)AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALE AFB FL  
ENGINEERING AND SERVICES LAB(U) Advanced Operational Aviation Medicine Course (8th).  
Held at Centre de Medecine Aeronautique, Brussels,  
Belgium, 24-28 March 1980.(U) Environmental Effects and Treatment Alternatives for  
Urea Runoff from Airfield De-Icing Operations

DISCUSSIVE NOTE Final rpt Jan 78 Jul 80.

MAY 81 100P

PERSONAL AUTHORS Bando, J.

AUG 80 40P

REPORT NO AGARD-R-081

PERSONAL AUTHORS Blum, Robert O.

REPORT NO AF52/CSL TR-80-40

UNCLASSIFIED REPORT

PROJECT NO 1800

SUPPLEMENTARY NOTE: Text in English and French

TASK NO 70

ABSTRACT (U) This report contains most of the lectures  
delivered to the course participants dealing with the  
cardiological problems of selection and screening, and  
epidemiology and prevention aspects and the problem of  
aging. Special emphasis was placed on the cardiovascular  
problems and follow-up of pilots of the new generation  
high performance aircraft. The course was conducted under  
the auspices of the Aerospace Medical Panel of AGARD  
(Author)

UNCLASSIFIED REPORT

ABSTRACT (U) A literature review is presented which  
covers chemical transformation of urea, aquatic toxicity,  
nitrogenous oxygen demand and eutrophication. Several  
feasible chemical technologies for urea runoff are  
examined, including advanced control, land application,  
trickling filter, breakpoint chlorination, and ammonia  
stripping (Author)DESCRIPTORS (U) \*Aviation medicine. \*Cardiovascular  
diseases. \*Aging (Physiology). Reports Epidemiology.  
Selection, Preventive medicine, NATO, PilotsDESCRIPTORS (U) \*Landing fields. \*Deicing systems.  
\*Urea. \*Runoff. Environmental impact statements.  
Literature surveys, Pollution statement, Toxic agents,  
Oxygen consumption Nitrogen, EutrophicationIDENTIFIERS. (U) Nitrogenous oxygen demand, Trickling  
filters, Breakpoint chlorination, Ammonia stripping  
WUAFCS19007008, PF02801F

AD-A101 244

AD A100 800

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## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 059028

AD A100 525 CONTINUED

compounds, Hydrocarbons, Smoke, Parameters, Correlation techniques

IDENTIFIERS (U) Engine smoke number PE92801F, NUNFFSC18007051

AD-A100 525 21/4 21/2 21/5  
AEROCHEM RESEARCH LABS INC PRINCETON NJ

(U) Correlation of Soot Formation in Turbojet Engines and in Laboratory Flames

DESCRIPTIVE NOTE Final rept Aug-Sep 80.

FEB 81 70P

PERSONAL AUTHORS Gould, Robert K. Olson, Douglas B.  
Calcute, Hartwell F.

REPORT NO AEROCHEM-TP-407

CONTRACT NO F49620-77-C-0029

PROJECT NO 1900

TASK NO 20

MONITOR AFSC/ESI:

TR-21-08

## UNCLASSIFIED REPORT

ABSTRACT. (U) Data obtained from aviation gas turbine combustor tests have been examined to determine the effects of fuel properties on soot-related measurements such as engine smoke number, combustor flame radiation, and/or combustor liner temperature. Some tests of smaller laboratory combustors were used to simulate these large combustors that were also examined. From the existing data it is clear that soot production is a strong function of the fuel chemical composition. Variations in the physical properties of the fuel do not correlate well with soot-related effects. In studies in which a broad range of fuel properties was examined, correlation of soot-related effects with basic fuel compositional parameters including (1) the hydrogen content of the fuel, (2) the aromatic content of the fuel, and (3) the amount of multiple-ring aromatics in the fuel show that typically only the first of these correlations hold. However, it has also been shown that fuel compositions can be chosen for which this correlating parameter falls

DESCRIPTORS (U) Jet engine fuels, Soot, Turbojet engines, Chemical composition, Physical properties, Flames, Hydrogen, Aromatic compounds, Polycyclic

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## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A100 489 21/4

AD-A100 489 CONTINUED

SOUTHWEST RESEARCH INST SAN ANTONIO TX MOBILE ENERGY DIV

exhaust smoke (Author)

(U) Fuel Microemulsions for Jet Engine Smoke Reduction

DESCRIPTORS (U) Jet engine fuels, Smoke abatement, Ethanol, Carbonoxides, Ethanol, Water, Fuels, Emulsions, Hydrocarbons, Hydrocarbons, Surface active substances, Test methods, Synergism, Smoke, Soot

DESCRIPTIVE NOTE Final rept 4 Jul 78-15 Mar 80.

MAY 80 52P

PERSONAL AUTHORS Nagell, D M , Fodor, G E , Moses, C A

IDENTIFIERS (U) Microemulsions, JP-2 fuel, JP-8 fuel, PC81102F, WAFESC1127801

REPORT NO SWRI-MED116

CONTRACT NO F08035-78 C-0213

PROJECT NO ILIR

TASK NO 78

MONITOR AFSC/ESL  
TR-80-25

## UNCLASSIFIED REPORT

**ABSTRACT (U)** The concept of water and alcohol/fuel microemulsions for the purpose of reducing smoke emissions from jet engine test cells was studied in a T-100 gas turbine combustor. Several ethanol/fuel, methanol/fuel, and JP-8/fuel microemulsions were prepared with JP-4 and JP-8 base fuels and the appropriate surfactants. Both metallic (ferrous) and nonmetallic (hydrazine) smoke-reducing additives were evaluated for possible synergistic effects when combined with the microemulsified fuels. The fuels were tested at the takeoff, climb, cruise and ground idle operating condition, and the exhaust smoke, flame radiation and gaseous emissions were measured. The exhaust smoke and flame radiation were significantly reduced by the addition of alcohols and water to the base fuels. Ethanol was found to be most cost effective because it required the least amount of surfactant, which was the most expensive fuel component. The tendency of the microemulsions to form soot was found to correlate with N/C ratio in the same way as typical petroleum-base fuels. Microemulsions which are well known for their ability to reduce smoke emissions also had the same effect on the microemulsions on the base fuels. It did not affect flame radiation. Hydrazine was not an effective additive for reducing

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A100 318 CONTINUED

IDENTIFIERS (U) Water reuse, Shonar wpslowwater.  
PEU2777A, AS84% W 719

AD-A100 318 0/5 0/20 13/2

LITTLE (ARTHUR D) INC CAMBRIDGE MA

(U) Research and Development for Health and Environmental  
Hazard Assessment Task Order 1 Development of Data  
Base Requirements for Human Health Based Water Quality  
Criteria for Military Recycle/Reuse Applications

DESCRIPTIVE NOTE Final rept Sep 79-Jun 80.

JUN 80 7HP

PERSONAL AUTHORS Shooter, Douglas, Anderson, Rosalind C.

REPORT NO ADL-83744 G1

CONTRACT NO DAMD17-79-C-9139

PROJECT NO CE182777A848

TASK NO 00

MONITOR AFCE2/ESL  
1R-80 33

UNCLASSIFIED REPORT

ABSTRACT: (U) The development of a methodology for derivation of non-potable reuse water quality criteria will be divided into two segments. Determination of the daily allowable dose of a specific contaminant which produces no adverse health effects, and Estimating the concentration of contaminant in the recycled/reused water which would cause the subject to assimilate the daily allowable dose. Considering the total exposure received from all sources, a second requirement is to develop an adequate data base to describe the subjects' exposure to recycled/reuse water. The methodology proposed in this report is intended to serve as a set of guidelines for the development of non-potable water quality criteria.

DESCRIPTORS (U) strength, Data bases, Toxicity, Water quality, Water, Reclamation, Recycled materials, Military applications, Dosage, Exposure (Physiology), Biological absorption, Inhalation, Drinking water, Chemical elements, Chemicals, Waste water, Contaminants, Organic compounds, Mathematical models, Tables (Data)

AD A100 318

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 095028

AD-A099 030 20/3 21/2 1/4

MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB

(U) Remote Sensing of Turbine Engine Gases

DESCRIPTIVE NOTE Final rept 1 Oct 79-20 Sen 80.

SEP 80 51P

PERSONAL AUTHORS Killinger, Dennis K , Menyuk, Norman ,  
Nooradian, Aram .

CONTRACT NO F19628 80-C-0002

PROJECT NO 1900

MONITOR ESD-AFESC/ESL  
TR-81-41, FR-81-18

## UNCLASSIFIED REPORT

ABSTRACT. (U) This is the FY 80 final report for a laser remote sensing program designed to investigate remote sensing techniques for the detection of jet aircraft exhaust gases. The specific tasks which were performed consisted of the following: (1) continuation of feasibility demonstration of CO2 TEA laser remote sensing system and the detection of NO and C2H4 in the atmosphere, (2) continuation of laboratory absorption measurements of CO, NO, and C2H4, (3) initial laboratory investigation of suitability of laser remote sensing of hydrazine, UDMH, and MCH, (4) implementation of digital data acquisition and processing system, and (5) preliminary development of dual-laser DIAL system (Author)

DESCRIPTORS. (U) \*TEA lasers, \*Carbon dioxide lasers, \*Remote detectors, \*Jet engine exhaust, \*Atmospheric chemistry, \*Jet engines, \*Gas turbines, \*Carbon monoxide, \*Nitrous oxide, \*Ethylene, \*Hydrazine, \*Methyl hydrazine, \*Monitoring, \*Measurement, \*Absorption, \*Concentration, \*Chemistry, \*Transmission, \*Laboratory tests, \*Data acquisition, \*Digital systems

IDENTIFIERS (U) PEQ2801F

AD-A099 038

## UNCLASSIFIED

SEARCH CONTROL NO 095028

AD-A099 034 11/8 11/3

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDAL AFB FL  
ENGINEERING AND SERVICES LAB(U) Protective Coatings for Steel Structures: Laboratory  
and Field Evaluation and Development of a Model  
Coating Guide Specification

DESCRIPTIVE NOTE Final rept Jun 77-Jan 80.

JAN 80 104P

PERSONAL AUTHORS Campbell, P G , Seller, J F , Sleeter, G  
A , Post, M A ,

REPORT NO AFESC/ESL-TF-80-20

PROJECT NO 14

TASK NO 5C

## UNCLASSIFIED REPORT

ABSTRACT. (U) The effectiveness and durability characteristics of ten specially selected coating systems were evaluated using laboratory and outdoor exposure testing techniques. Test emphasis was placed on testing combinations of coating materials that could protect high value steel structures. Additionally, the authors have written a model coating guide specification. This specification, when combined with a special paint Inspector's Guide that was also developed as part of this project, will help coating inspectors select proper coating systems based on the existing structure and condition of the surface to be coated. The Paint Inspector's Guide is included as Appendix A to this report. It can be used by paint inspectors to help characterize paint failures and to advise paint inspectors when over-sealing painting applications. (Author)

DESCRIPTORS (U) \*Steel, \*Protective coatings, \*Corrosion resistance, \*Structural steel, \*Structural members, \*Specifications, \*Standards, \*Inspection, \*Quality control, \*Outdoor, \*Exposure (General), \*Weathering, \*Sampling, \*Salt spray tests, \*Field tests, \*Paints

IDENTIFIERS (U) WUAFESC21045C0Z, PF63723F

I/C NO MCIC-115430

AD-A099 034

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A089 534 CONTINUED

AD A089 514 6/20 21/4 21/5 1

OREGON STATE UNIV CORVALLIS DEPT OF CIVIL ENGINEERING

(U) Bacterial Toxicity and Metabolism of Thren Hydrazine Fuels

DESCRIPTIVE NOTE Final rept 10 Jan 78-15 Aug 79.

SEP 80 11PP

PERSONAL AUTHORS Kane, Donald A ; Williamson, Kenneth J .

CONTRACT NO F08037-78-M-0889

PROJECT NO 2103

TASK NO 7M

MONITOR AFESC/ESL/AFIF  
TR-80-49, CI-80 630

UNCLASSIFIED REPORT

IAC DOCUMENT TYPE MCIC - HARD COPY --

IAC SUBJECT TERMS M-(U)Coatings, Corrosion, Surface Studies, Paint, Humidity, Salt Spray, Weathering, Cleaning, Sulfuric Acid, Engineering Steel, Specifications .

535

ABSTRACT (U) Hydrazine based fuels are used for Titan and Minuteman missiles and the F-10 aircraft and by the Space Shuttle program. These uses represent significant production, transportation, and storage of these fuels. and, thus, a serious threat to the aquatic environment and the potential for accidental release. This research sought to determine the toxicity of hydrazine (H), monomethyl hydrazine (MMH), and unsymmetrical dimethyl hydrazine (UDMH) to four enriched bacterial cultures Nitrobacter, Nitrosomonas, Nitrobacter anaerobic bacterie, and denitrifying bacteria. In addition, the metabolism of hydrazine by Nitrosomonas - Nitrobacter was examined. The toxicity studies used batch bioassay methods with response measured in terms of substrate metabolism rates. Results showed that MMH and UDMH produced a 50% reduction in metabolism rate of Nitrobacter, Nitrosomonas - Nitrobacter, and denitrifying bacteria and a 100 and 100 milligram per liter, respectively, monomethyl hydrazine at 15, 21, 25 and 10 milligram per liter, respectively, and UDMH at 1800, 35, 2300, and 12,500 milligram per liter, respectively. It was concluded that 50% of these three fuels could be expected to seriously disrupt the natural bacterial balance in the aquatic environment. In addition, use of biological waste treatment for detoxification of these three fuels is not

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A089 514 CONTINUED

AD-A089 499 12/1 9/1 9/3 1/3

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RAND CORP SANTA MONICA CA

DESCRIPTORS (U) \*Toxicity, \*Hydrazine, \*Aluels \*Methyl hydrazines, \*Dimethyl hydrazine(1-1), \*Metabolism, \*Bacteria, \*Biodegradation, \*Jet engine fuels, \*Liquid rocket fuels, \*Response(Biology), \*Degradation, \*Acclimatization, \*Bioassay, \*Anaerobic bacteria, \*Physical properties, \*Tables(Data), \*Detoxification, \*Colonies(Biology), \*Inhibition, \*Rates, \*Gases, \*Chemical analysis, \*Recovery

IDENTIFIERS (U) \*Microbeacter, \*Nitrosomonas, \*Denitrifying Bacteria, \*WJESL21031W93, \*PE83723F

(U) An Analysis of Combat Aircraft Avionics Production Costs

DESCRIPTIVE NOTE Interim rept

MAR 81 155p

PERSONAL AUTHOR Dryden, J , Britt, T , Binlings-Dupreiter, S ,

REPORT NO RAND/N-1085-AF

CONTRACT NO F48620-77-C-0023

UNCLASSIFIED REPORT

\*RETRACT (U) This report describes research directed toward developing parametric estimating relationships for the production costs of avionics suites and systems. The research sample comprised 17 combat aircraft and their avionics equipment. Potential explanatory variables were selected based on interviews with manufacturers about factors affecting avionics costs and the appropriateness of the variables for use in planning studies early in system acquisition. Multivariate regression analysis techniques were used to determine the statistical properties of candidate estimating relationships for whole suites and individual systems. The estimating equations derived for suites were generally satisfactory and keys to statistically estimating avionics costs. Attempts to estimate individual avionics systems were much less satisfactory but offer improvements over the simple cost per pound metrics often used. The authors conclude that objective means for expressing technology change and its importance for avionics cost estimation remain a concern for future research.

DESCRIPTORS (U) \*Parametric analysis, \*Avionics, \*Cost analysis, \*Management planning and control, \*Planning programming budgeting, \*Cost estimates, \*Multivariate analysis, \*Regression analysis, \*Acquisition, \*Attack aircraft, \*Parameters, \*Correlation techniques

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A098 304 19/4 14/2 13/12 13/2 1/5 20/11  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB

(U) Accidental Impact Descriptor Application Methodology  
 DESCRIPTIVE NOTE Final rept 31 Mar 1 Aug 80.

AUG 80 48P

PERSONAL AUTHORS Thompson, James D , Myrick, Donald R ,  
 REPORT NO AFESC/ESL-TR-80-41

PROJECT NO 2103

TASK NO 9P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also AD-A070 480

ABSTRACT (U) This report provides the intended user of  
 accidental impact descriptors for Air Force air to-ground  
 weapon range planning activities a brief summary of their  
 development, the step-by-step procedure for properly  
 applying them, and an example problem. The descriptors  
 are provided in Appendix A. These descriptors show  
 containment contours for significant percentages of  
 impacts resulting from weapon delivery training and  
 weapon tests conducted in the last 12 years. The  
 application methodology is adopted from a previous report  
 and includes qualifications for use of composite  
 descriptors. Identification criteria for the graphical  
 and resolution limitations are provided. For the graphical  
 descriptors used in this report do not require a  
 particular land-use conflict, further analysis is  
 recommended (Author)

DESCRIPTORS (U) Impact point, Range safety, Spatial  
 distribution, Coding Weapon delivery, Air to surface,  
 Accidents, Air Force facilities, Containment (General),  
 Contours, Hazards, Land use Training ammunition, Free  
 fall weapons, Flight paths, Bombing, Firing  
 tests (Ordnance), Errors, Miss distance, Air force  
 training, Aviation accidents

IDENTIFIERS (U) RACIRange Compatibility Use Zones),  
 Strafing Impact descriptors PEG37237 WUSL2103B980

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AD A098 798

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## UNCLASSIFIED

AD-AD28 798 CONTINUED DTIC REPORT: BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 IDENTIFIERS (U) Granular materials, WUAFESC21042322, AD-AD28 288 5/1/2 7/4  
 PER3708F UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT 061  
 (U) Nitric Oxide Measurement Study Volume I Optical Calibration.  
 OCT 79 221P  
 PERSONAL AUTHORS Dodge, L. G.; Colket, M. B.; III; Zabinski, M. F.; Dineen, J.; Seery, D. J.  
 REPORT NO UTRC/R79-894150-1, FAA-EE-8026  
 CONTRACT NO DOT-FA77MA-4081  
 MONITOR AFESC/ESL.NASA  
 TR-80-12, CR 150881

## UNCLASSIFIED REPORT

ABSTRACT (U) Calibration devices suitable for providing known amounts of nitric oxide (NO) at temperatures ranging from 300 K (200°C) and pressures of 0.5 atm (50 kPa) to 2.0 atm (200 kPa) are described with their design considerations. Methods for confirming nitric oxide concentrations are given. The detection theory for the absorption of ultraviolet radiation in the ground state band of nitric oxide is reviewed. Experimental values for oscillator strengths are provided. Experimental values for various collision partners are provided. Experimental results confirming the adequacy of a computer spectral model and, hence, the calibration are presented along with the details of the model. Finally, the results of an empirical calibration of an infrared gas correlation spectrometer are given. (Author)

DESCRIPTORS (U): Combustion Products; Nitrogen Oxides; Optical Analysis; Measuring Instruments; Calibration; Measurement; Probe; Concentration (Composition); Environment; Absorption Spectra; Ultraviolet Spectroscopy; Infrared Spectroscopy; Temperature Gradients; Reaction Kinetics; Oscillators; Collision Grounding; Flames; Pyrolysis; Gas Flow; Heaters; Mathematical Models; Error Analysis

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 059020

AD A097 807 21/2 7/3

AD A097 807 CONTINUED

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CONN

(U) Nitric Oxide Measurement Study Volume III, Comparison of Optical and Probe Methods

MAR 80 98P

PERSONAL AUTHOR: Zdziewski, M F . Dodge, L G . Colket, M B . III, Sney, D J .

REPORT NO UTRC/P80-99#180-3, FAA/EE 30-30

CONTRACT NO DOT-FA77WA-4081

MONITOR AFESC/ESL, NASA  
TR-80-14, CR-158803

Metals, Probes, Flames, Exhaust gases, Methane, Quantitative analysis, Comparison, Test methods, Gases, Sampling, Flow, Turbulence, Stainless steel

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE Also available as Rept nos NAFPC-PE 39C and EPA-460/3-80-015 See also Volume 2, AD-A097 845

ABSTRACT (U) Nitric oxide (NO) was measured in the exhaust of three different combustion systems by in situ ultraviolet absorption spectroscopy. The measurements were made after gas sampling with several probe designs. The three combustion systems were (1) a flat flame burner fueled with CH<sub>4</sub>/H<sub>2</sub>O<sub>2</sub>; (2) a research swirl burner fueled with C<sub>3</sub>H<sub>8</sub>/air; and (3) a modified PT2 combustor operated on Jet A/air. Each combustion system was run at several different conditions so that probe and optical measurements could be obtained over a wide range of exhaust environments encompassing products from lean, stoichiometric, and rich flames. Laminar to turbulent flows, and temperatures at centerline from 100 K to 1800 K. The results obtained with the metallic, water-cooled probes of different designs (all expansion type) agreed with the optical results to within 25%. Some small losses of NO (10-15%) were observed in a lean methane flame at 1800 K with an uncooled stainless steel probe, but under fuel-rich conditions up to 800 K NO destruction was minimal and experimental facilities are described, previous results are compared, and a summary of the major findings of this study is given. (Author)

DESCRIPTORS (U) \*Combustion products, \*Nitrogen oxides \*Measurement, \*Optical analysis, \*Chemiluminescence, Environments, Research facilities Burners Combustion

AD A097 1107

AD A097 807

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 081028

AD A087 545 CONTINUED

AD-A087 545 21/2 7/4

ENVIRONMENTS Burners, Metals, Probes, Flames,  
Flammability, Analyzers, Heat transfer, Quenching, Models,  
Test methods, Flow, Turbulence, Sampling, Samplers.

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CONN  
(U) Nitric Oxide Measurement Study Volume II Probe  
Methods.

MAY 80 113P

PERSONAL AUTHORS: Colket, M. B., III, Jablonski, K. F.,  
Chilappatt, L. J., Dodge, L. G., Guller, R. H.

REPORT NO. UTRC/R80-094150-2, FAN/EE-80-29

CONTRACT NO. DOT-FA77NA-4061

MONITOR AFESC/ESL,NAGA  
TR-80-13, CR-108492

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Also available as Rept. no. NAPS-PF-  
38C and EPA-460/3-80-014. See also Volume 3, AD-A087 607

ABSTRACT (U) Experimental facilities used in studying  
the performance of probes and sampling systems for  
measuring NO are described. A critical review of the  
literature on probe measurements of NO sub y is given  
with emphasis on reported results indicating that probes  
flameth the total concentration of NO sub x in a  
flame. Also, a review of a probe measurement technique  
phenomena are reviewed and a probe measurement technique  
including heat transfer is presented. Kinetics of NO loss  
oxid in flames are given. Sampling probes are described  
that were designed to preserve NO and are suitable for  
measurements on small and large combustors. Probes were  
designed to cool the gases both convectively and  
aerodynamically. Performance of these probes is compared  
with model predictions. Concentrations of nitric oxide  
were measured using several probes for each of three  
flame environments. The values measured with each probe  
are compared and related to speed levels of NO in  
addition, concentration profiles required to compare  
probe measurements with optical measurements are provided  
(Author)

DISCRIPTIONS: (U) Combustion products, Nitrogen oxides  
measurement, Optical analysis, Chemiluminescence,  
Predictions, Calibration, Research facilities.

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SEARCH CONTROL NO 085028

AD-A097 212 13/1

AD A088 534 13/3 13/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LABAIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB(U) The United States Air Force Academy Solar Energy  
Research(U) Evaluation of Vibratory Rollers for Bomb Damage Repair  
OFFSCRIPTIVE NOTE Final rept Oct 78-Sep 78.

DESCRIPTIVE NOTE Final Interim rept May 78-Jan 80.

AUG 80 71P

JUL 80 172P

PERSONAL AUTHORS Egan, Anthony, Benson, Joel D, Cornwallus,  
Kenneth A, Riggs, Gregory E.

PERSONAL AUTHORS Knox, Kenneth J.

REPORT NO AFESC/ESL-TR-80-34

REPORT NO AFESC/ESL-TR-80-43

PROJECT NO 2084

PROJECT NO 2054

TASK NO 80

TASK NO 80

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) This research continued to gather operational performance data and maintenance experience on a retrofit residential solar space heating system. Data analysis includes comparison to prior years' results. Separate data were generated to analyzing the performance of evacuated tube collectors and the home's dependency on solar energy during a reflected winter period. Considerable attention is given to actions that were taken to prepare the system for a return to normal occupancy (the home was vacant until October 1978). Information concerning the perceived need for development of an operations and maintenance manual and a 'homeowner's' manual is included. Complete copies of the developed manuals are appendices to this report (Author).

DESCRIPTORS (U) \*Solar heating, \*Solar energy, \*Housing (Dwellings), Retrofitting, Performance (Engineering), Maintenance, Solar collectors, Tubes, Systems engineering, Manuals

IDENTIFIERS (U) PE60708F WUAFESC20545005

DESCRIPTORS (U) \*Rollers, Vibrators (Mechanical), Compacting, Gravel, Limestone, Solis, Runways, Bomb Damage, Repair, Performance tests

IDENTIFIERS (U) Crushed stone, \*Vibratory rollers, PE64708F, WUESI20546801

ABSTRACT (U) Four vibratory rollers in the 8 5 to 17 ton range were evaluated for use in bomb damage repair of airfields. The rollers were tested for their compaction ability on grade crushed limestone. After this initial testing the two most promising rollers were tested by repairing simulated bomb craters using 24-inch thick layers of crushed limestone compacted only from the surface. These repairs were tested with F-4 load-carrying traffic. Despite difficulties in predicting roller performance, 10-ton vibratory rollers on heavily damaged areas were capable of compacting crushed limestone from the surface only to support F-4 loads (Author).

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## DTIC REPORT BIBLIOGRAPHY

AD A085 928 13/2 1/8

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Small Crater Expedient Repair Test

DESCRIPTIVE NOTE. Final Rpt Jul-Aug 78.

AUG 80 110P

PERSONAL AUTHORS Knox, Kenneth J.

REPORT NO AFESC/ESL-TR 80-42

PROJECT NO 210A

TASK NO 28

UNCLASSIFIED REPORT

ABSTRACT (U) This report describes actual field repairs of six small craters, four using unsurfaced crushed limestone compacted only from the surface with 10-ton vibratory compactors, and two repaired with hand-mixed polymer-concrete. Following the repairs the patches were trafficked with an F-4 aircraft. The crushed limestone method proved suitable for the repair of small craters, the hand-mixed polymer-concrete method was not suitable for repairs larger than approximately five feet in diameter (scabs) (Author)

DESCRIPTORS. (U) \*Repair, Runways, Bomb damage, Craters, Filling, Gravel, Limestone, Concrete, Polymers

IDENTIFIERS (U) \*Bomb damage repair, Crushed stone, Polymer concrete, PB83723F, UAUFESC21042822

TAC NO PL-OJ8848

TAC DOCUMENT TYPE PLASTIC - MICROFICHE --

TAC SUBJECT TERMS P--(U)Repair, Polymer concrete, Soil surfacing, Aggregate, Patching, Airfield, PMAA, Silika, Quality assurance, Limestone, Cements, Blends, Zz Unlimited.

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AD-A085 891

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SEARCH CONTROL NO 055028

AD A085 891 1/8 13/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Flush AM-2 Mat Patch for Rapid Runway Repair

DESCRIPTIVE NOTE Final Rpt May 78-Nov 78.

SEP 80 94P

PERSONAL AUTHORS Greene, James L.

REPORT NO AFESC/ESL-TR-80 45

PROJECT NO 210A, 2054

TASK NO 28, 8B

UNCLASSIFIED REPORT

ABSTRACT (U) This report describes a research and development program to investigate the feasibility of using AM-2 landing mats for a flush surface over bomb craters in runways. The AM-2 landing mat concept under test was designed to allow flexibility to adjust to varying crater sizes. Four systems of anchoring AM-2 mat patches to the surrounding pavements were tested. Each system, when installed over filled craters, was tested with an F-4 load cart (Author)

DESCRIPTORS (U) Landing mats, Runways, Concrete, Bomb damage, Craters, Filling, Coverings, Panels, Rails, Field tests, Load forces, Deformation

IDENTIFIERS (U) \*AM-2 landing mats, UAUFESC21042822, UAUFESC2054832, PER4708F, PB83723F

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO QHS078

AD-A095 057 21/4 21/5 1/3 AD A095 057 CONTINUED

## GENERAL ELECTRIC CO CINCINNATI OH AIRCRAFT ENGINE GROUP

(U) Evaluation of Fuel Character Effects on J79 Smokeless Combustor

DESCRIPTIVE NOTE Final technical report 1 Jul 79 1 Jun 80

NAV 80 194P

PERSONAL AUTHORS Gleason, C C ; Oller, T L ; Shaysenon, M W ; Kernworthy, M J .

REPORT NO PB0AE0318

CONTRACT NO F33610-78-C 2023

PROJECT NO 3018

TASK NO 05

MONITOR AFVAL AFESC/EEL  
TR-80-2022, TR-80-48

## UNCLASSIFIED REPORT

ABSTRACT (U) Results of a program to determine the effects of broad variations in fuel properties on the performance, emissions, and durability of the J79-17C turbojet engine combustion system are presented. Thirteen different fuels were tested, covering a range of hydrogen contents, aromatic types, boiling range, and viscosities. At high power operating conditions, fuel hydrogen content was found to be a very significant fuel property with respect to linear temperature, flame radiation, smoke, and NOx emission levels. At idle and cruise operating conditions, CO and the hydrogen content of the fuel had no effect on the hydrogen content and relative lightoff of the fuel. The hydrogen content and relative lightoff correlated with the relative fuel droplet size. Altitude ceiling limits at low flight Mach numbers were fuel dependent and also correlated with the relative fuel droplet size. Combustor liner life analyses, based on the test data, yielded relative life predictions of 1.00, 0.93, 0.83, and 0.73 for fuel hydrogen contents of 14.5, 14.0, 13.0, and 12.0 percent, respectively. High temperature cyclic fuel nozzle fouling tests revealed significant effects of fuel quality and operating temperature on nozzle life. The results correlated with laboratory

AD-A095 057

AD A095 057

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CYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A084 802 13/1 15/5  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB  
 (U) The U.S. Air Force Academy Solar Energy Research  
 Project Summary Report

AD-A084 187 17/2 6/20 6/18  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB  
 (U) The Toxicity and Biodegradability of Hydrazine  
 Wastewaters Treated with UV-Chlorinolysis

DESCRIPTIVE NOTE Rept for Apr 78-Jan 80.  
 DESCRIPTIVE NOTE Final rept Dec 78-Feb 79.

JUL 80 103P APR 80 80P

PERSONAL AUTHORS Cornelius, Kenneth A. Machinski, Anthony M ; Farmland, Jay A.

REPORT NO AFESC/ESL-TR-80-32 REPORT NO AFESC/ESL-TR-80-31

PROJECT NO 2054 PROJECT NO 1900

TASK NO 50 TASK NO 70

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT (U) This report summarizes the solar energy research which was conducted by the U.S. Air Force Academy from April 1978 to January 1980. This research consisted of investigations on a retrofit space heating system which was installed on a typical military family housing (MFI) unit. This summary uses a lessons learned and designer tips approach in its discussion of the solar system's operation. This discussion is organized around the many areas of solar technology which were investigated during the course of this project. Those major areas were energy conservation effects, solar collectors, thermal storage, control systems, Thermography studies, performance comparison to a design model, and homeowner aid maintenance manual development. A thermal performance summary of the solar system is also presented. The report concludes with numerous which the recommendations regarding policy initiatives which the Air Force should take to foster conversion to solar technology (Author)

DESCRIPTORS: (U) Solar heating, Military facilities, Heating (Buildings), Solar collectors, Solar energy, Energy consumption, Energy conservation, Cost analysis, Installation, Space heaters, Maintenance, Operation, Storage tanks, Thermography, Test and evaluation, Performance (Engineering)

IDENTIFIERS (U) WJAFESC20545005, PEJ4708F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A094 017 11/3

HARCO CORP MIDINA OH

(U) Pipe-to-Soil Potential Limits for Protective Coatings  
DESCRIPTIVE NOTE Final rept Nov 77-Apr 80.

NOV 80 38P

PERSONAL AUTHORS Harock, Bernard .

CONTRACT NO F08B35-77-C-0248

PROJECT NO 2104

TASK NO RC

MONITOR AFESC/ESL  
IR 80-20

AD-A094 017 CONTINUED

Hydrogen, Currents, Asphalt Polarization, Water, Value  
Sulfates, Standards

IDENTIFIERS (U) Potential WUESL21045C01, PEB3723F

IAC NO PL-038540

IAC DOCUMENT TYPE PLASTIC - MICROFICHE --

IAC SUBJECT TERMS P--(U)polarization, Bonding,  
Protective coatings, Coatings, Underground applications  
Epoxy, Pitch, Asphalt, Enamels, Coal tar, Corrosion  
resistance, Pipe, Galvanic corrosion, ScotchMote 212,  
Water immersion, HDPE, Servitrap, Electrical properties,  
Property degradation, Standards, Polyethylenes, 22  
Unlimited

## UNCLASSIFIED REPORT

**ABSTRACT** (U) This report summarizes the results of a study undertaken to determine the limiting potential criteria for cathodic protection of coated metallic underground structures. Tests of 30 days duration were performed in Houston tap water on four coatings, i.e., fusion bonded epoxy, coal tar, plastic tape and asphalt. Each coating was cathodically protected at polarized instant off potential levels of -1 02, -1 07, -1 12, -1 17, and -1 22 volts to copper-copper sulfate. It was found that hydrogen evolution is initiated at a polarized potential of -1 12, volts and becomes more vigorous as the applied current is increased. The polarized potential value increases as the current increases only up to a value of -1 22 volts. An increase in applied current beyond that value increases the hydrogen evolution and increases the OH potential, but there is no measurable increase in the OH potential. The different coatings tested reacted differently in the tests. These short term tests indicated that the use of coating experience of cathodic protection is not applicable. Cathodic protection at an OH potential where no gas was evident, and another coating experienced no disbondment even at -1 22 volts under vigorous hydrogen evolution (Author)

**DESCRIPTORS** (U) \*Protective coatings, \*limitations,  
\*Cathodic protection, Copper compounds, Plastics Tapes.

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AD-A094 003 13/2 21/2 12/1 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
AD-A094 003 CONTINUED

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Analysis for the Accuracy Definition of the Air  
Quality Assessment Model (AQAM) at Williams Air Force  
Base, Arizona Volume II Appendices

DESCRIPTIVE NOTE Final report Jul 78-Mar 80.

MAK 80 281P

PERSONAL AUTHORS: Yamartino, R. J., Conley, L. A., Roto, D.  
N., Lawlich, F. J., Murphy, E. P.

REPORT NO. AFESC/ESL-TA-80-18-VOL-2

PROJECT NO 1900

YASK NO 20

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Volume 1, AD-A094 171

ABSTRACT. (U) The Air Quality Assessment Model (AQAM) overall predictive accuracy is analyzed using actual air base ambient air quality measurements. These measurements of CO, NO, NO<sub>2</sub>, TSP, O<sub>3</sub>, and visibility at Williams Air Force Base, Arizona, from June 1978 to June 1977 were compared with AQAM's predicted air pollution concentrations to determine AQAM's predictive power. The AQAM accuracy is analyzed on an hour-by-hour basis and statistical conclusions are that AQAM accuracy is well within the accuracy ranges expected for Gaussian urban dispersion models. Even though an attempt was made to select an isolated area with low background emissions, the background concentrations had to be accounted for in the analysis. Concentrations in the air base vicinity were extremely low when compared with background concentrations resulting from urban emissions. The AQAM model tended to underpredict the pollutant concentrations. The results also indicate that AQAM is especially accurate in simulating the potential worst case airbase concentrations associated with morning hours, low wind speeds, stable atmospheric conditions, and high activity (author)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 005028

AD-A093 817 CONTINUED

AD A093 817 13/2 12/1

LITTLE (ARTHUR D) INC CAMBRIDGE MA

(U) Spill Assessment Model (SAM) Procedure for Manual Field Calculations

UNCLASSIFIED NO. Final rept Feb 78-Feb 80

APR 80 101P

PERSONAL AUTHORS Potts, Richard G. ,Negopian, John H. ,Schlosser, George W. ;

CONTINUED NO F08038-79-C-0084

PROJECT NO SAMS

TASK NO DP

MONITOR W/FSC/ESL  
TR-80-22

UNCLASSIFIED REPORT

Availability Document partially illegible

**ABSTRACT** (U) The objective of the field procedure is to provide a means of rapidly assessing the approximate extent of concentrations in water in excess of hazard levels by application of the spill assessment model (SAM). This manual provides a simple calculation procedure that can be rapidly applied in the field to obtain estimates of the potential extent of hazard levels from a discharge of soluble hazardous materials into navigable waterways. These field procedures have been developed from complex analytical and computer-based models describing the behavior of various types of spilled chemicals in water developed in ES-TP-80-07. The calculation procedures for field use have been developed in the form of a series of graphs and tables, and permit hazard extent estimates to be rapidly made when time or resources are not available for more complex computation. The data required for these field computations can be immediately obtained or estimated. The procedures for field use may be applied to obtain estimates of the concentration in water resulting from the spill of a soluble chemical having a density close to that of water. It is assumed that the chemical is fully soluble in water, and that all the discharged chemical goes into solution with water in

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particular, effects of chemical reactions, phase changes, vaporization from a spreading liquid are not incorporated. These assumptions lead to estimates of concentrations in water that are conservative. The part of SAM utilized as the basis for the field calculations addresses only instantaneous point source discharges into a flowing river.

**DESCRIPTORS** (U) \*Water pollution, \*Water analysis, \*Hazardous materials, \*Chemicals, \*Streams, \*Mathematical models, Sampling, Spilling, \*Hydroline, Concentration(Composition), Toxic hazards, Field conditions, Rivers, Channels, \*Downstream flow, Solubility, Accidents, \*Accidents, \*Depth, \*Sedimentation, \*Velocity, Graphs, Computations, Tables(Data), Manuals, Field tests

**IDENTIFIERS** (U) PF750015 MUAFESCA/MSDP02

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO D62028

AD-A093 486 21/0 1 7/3 8/8 AD-A093 486 CONTINUED

CALIFORNIA UNIV RIVERSIDE STATEWIDE AIR POLLUTION  
RESEARCH CENTER(U) Atmospheric Chemistry of Hydrazines Gas Phase  
Kinetics and Mechanistic Studies

IDENTIFIERS (U) Gas phases, P62901F, MUFESC18002015

DESCRIPTIVE NOTE: Final rept Sep 78-Jun 80.

AUG 80 90P

PERSONAL AUTHORS Pitts, James M., Jr., Tuazon, Ernesto C.,  
Carter, William P. L., Winer, Arthur N., Harris, Geoffrey N.

CONTRACT NO F08605-78 C-0307

PROJECT NO 1800

TASK NO 20

MONITOR AFSC/ESL  
TR-80-39

UNCLASSIFIED REPORT

ABSTRACT. (U) Relatively little work has been done on the atmospheric chemistry of nitrogen-containing compounds such as amines and hydrazines, which are widely used in industrial and military applications. However, the discovery of compounds such as N-nitrosamines in the environment has focused attention on the potential role of nitrogenous compounds in the atmosphere. The Air Force is presently assessing the environmental impact of the Space Transportation System which uses hydrazines as one of the fuels. In addition, hydrazine is used as a propellant in the F-18 for emergency power. Both uses will result in potent atmospheric releases which should be controlled to a degree dictated by the impact of hydrazines on ambient air quality. Thus, the present study was designed to experimentally evaluate the atmospheric fate of unsubstituted hydrazine (NH<sub>2</sub>H<sub>2</sub>), monomethylhydrazine (MMH), and unsymmetrical dimethylhydrazine (UDMH).

DESCRIPTORS (U) Hydrazine, Atmospheric chemistry, Reaction kinetics, Gases, Air quality, Phase, Amines, Military applications, Release, Humans, Methyl hydrazines, Environmental impact statements, Nitrogen compounds

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AD-A092 185 13/2 1/5

NORTHROP SERVICES INC LAS VEGAS NV

(U) Williams Air Force Base Air Quality Monitoring Study.

JUL 80 91P

PERSONAL AUTHORS Shoemaker, D C , Gordon, S J , Ehler, M L .

COUNTRY OF ORIGIN USA-68-03-2591

MONITOR EPA/600/4-AFESC/ESL  
40-037, TR-78-31

UNCLASSIFIED REPORT

ABSTRACT (U) Air quality and meteorological data were collected continuously from a network of five ground monitoring stations located at Williams Air Force Base WAFB near Phoenix, Arizona, during June 1978 through June 1977. Data reported here will serve as detailed input for defining the accuracy limits of the Air Quality Assessment Model. The data have been analyzed in order to determine the air quality impact attributable to WAFB operations. Also reported are the results of preliminary results obtained from several related special studies designed to characterize the environmental impact of WAFB operations. The data indicate no significant air quality impact at WAFB resulting from aircraft operations (Author)

DESCRIPTORS (U) Air quality, Air pollution, Air Force facilities, Airports, Aircraft exhaust, Monitoring, Spectrometers, Gas chromatography, Chemiluminescence, Nephelometers, Laser velocimeters, Pyrometers, Hydrocarbons, Nitrogen oxides, Methane, Carbon monoxide, Meteorological data, Mathematical models, Measurement, Data processing, Pollutants, Emission, Dispersion

IDENTIFIERS (U) Environmental impact Gaussian plume model

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AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LHM

(U) Modal Analysis for Aircraft Response to Runway Surface Roughness

DESCRIPTIVE NOTE Final report 1 Jun 78-30 Jun 80.

JUN 80 41P

PERSONAL AUTHORS Gajewski, Ralph R .

REPORT NO AFESC/ESL-TR 80-32

PROJECT NO 2104

TASK NO 2B

UNCLASSIFIED REPORT

ABSTRACT (U) This report develops one and three degree-of-freedom linear vibration models for the prediction of aircraft response to runway surface roughness. The equations of motion are integrated in principal coordinates using modal analysis. The modal parameters required are natural frequency, damping ratio, and mode shape for each degree of freedom. Comparison of results is made with the TAXI code that has a nonlinear strut model. Results are presented for asymmetric motion due to stall profiles in the runway (Author)

DESCRIPTORS (U) Surface roughness, Dynamic response Runways, Aircraft, Vibration, Frequency, Damping, Mathematical models

IDENTIFIERS (U) Modal analysis, PEG3723F MUESL2104.8-30

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DYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A091 803 CONTINUED

WUAFESCSANSDDP02

AD-A091 803 13/2 8/2

LITTLE (ARTHUR D) INC CAMBRIDGE MA

(U) Spill Assessment Model User's Manual

DESCRIPTIVE NOTE Final rept Feb 79-Feb 80.

MAY 80 194P

PERSONAL AUTHORS Potts, Richard G ; Hagopian, John H .

CONTRACT NO F08R35-79-C-0084

PROJECT NO SAMS

TASK NO DP

MONITOR. AFESC/ESL  
TR-80-27

UNCLASSIFIED REPORT

ABSTRACT (U) This report is a user's guide to the Spill Assessment Model (SAM) which is a mathematical model for application in assessing the impact of catastrophic spills in waterways as developed in ESL-TR-80-07. The spill model addresses instantaneous and continuous point source discharges into water courses including rivers, lakes, streams, and estuaries. The model is a general, sized, and not necessarily restricted to the scope of application to hazardous materials. SAM estimates the duration of hazardous concentrations in water-bodies associated with accidental discharges and determines when these concentrations drop below toxic levels. SAM is designed as a management tool to support clean-up operations in the event of a spill to permit post incident analyses, and to serve as a basis for contingency planning. (Author)

DESCRIPTORS. (U) Water pollution, Oil spills, Computerized simulation, Computer program documentation, Hazardous materials, Estuaries, Lakes, Rivers, Chemical properties, Dispersions, Rocket propellants, FORTRAN, Input output processing, User needs, Handbooks, Specifications

IDENTIFIERS (U) SAM(Spill Assessment Model) SAM computer program, CDC 8800 computers, PE78001F.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A091 717 4/2 0/8 TENNESSEE UNIV KNOXVILLE DEPT OF CIVIL ENGINEERING AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL ENGINEERING AND SERVICES LAB

(U) Air Force Runoff Model (AFRUM) User Manual Documentation

DESCRIPTIVE NOTE Final (rept Oct 78-Jul 80.

JUL 80 81P

PERSONAL AUTHORS Swerton Donald E , Schlossingsle, George W , Siebert, Michael G .

CONTRACT NO F08035-77-C 0254

PROJECT NO 1900

TASK NO 80

MONITOR AFSC/ESL TR-8C-48

## UNCLASSIFIED REPORT

ABSTRACT (U) The Air Force Runoff Model (AFRUM) is a stormwater runoff simulation model designed to predict stormwater flow and sediment loading for design stormwater flow and sediment loading limited to 2,000 acres or less. The principal model inputs are watershed areas, land use characteristics, percent forested, percent impervious, and percent denuded. The input will also include either an observed hydrograph or an estimated Soil Conservation Service Curve Number (CN). The model is based upon 410 storms in 38 watersheds. Output is both tabular and graphical and provides the watershed hydrograph, pollutograph, and discussion of model assumptions. This report provides a background of the model, batch user instructions for CDC 6800 computers, and two example problems. The complete software package is provided in the Appendix. (Author)

DESCRIPTORS (U) Runoff, Storms, Rainfall, Watersheds, Water Pollution, Mathematical models, Computerized Simulation, Programming manuals

IDENTIFIERS (U) AFRUM computer program

NUAF 11, 005, PE02801F

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DESCRIPTORS (U) Mathematical models, Air quality.

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## DTIC REPORT BIBLIOGRAPHY

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\*AIR Pollution, Air force facilities, Airports, Military aircraft, Plumes, Carbon monoxide, Nitrous oxide, Methane, Hydrocarbons, Pollutants, Measurement, Meteorological data, Concentration(Composition), Wind velocity, Time Dispersions, Frequency, Distribution, Accuracy, Time intervals, Statistical analysis

LITTLE (ARTHUR D) INC CAMBRIDGE MA

(U) Mathematical Development of the Spill Assessment Model (SAM) for Hydroxine and Similar Acting Materials in Water Bodies

DESCRIPTIVE NOTE Final rept Feb 78-Feb 80.

FEB 80 388P

PERSONAL AUTHORS Polts, Richard G; Macgibbon, John H; Woodruff, Glenn A; Raj, Phani P;

CONTRACT NO F08835-78-C-0064

PROJECT NO SAM3

TASK NO DIP

MONITOR AFESC/ESL  
TR-80 07

## UNCLASSIFIED REPORT

ABSTRACT (U) The objective of this work was to develop a mathematical model for application in assessing the impact of catastrophic spills. Specifically, the model addresses instantaneous and continuous point source discharges into water courses including rivers, lakes, and estuaries. The spill model primarily addresses dispersive characteristics of spills of hydroxine and similar acting materials. The model is developed in a generalized form using parameters and interchangeable data items so as not to restrict the scope of application. Results which can be produced by the model include the pollutant concentration as a function of location, time, and physical, chemical, and biological characteristics of the pollutant. The spill model estimates the extent and duration of hazardous discharges and determines when these concentrations drop below toxic levels. The spill model is designed to become a management tool to support a clean-up operation in the event of a spill, to provide emergency discharge contingency planning, to permit post incident analyses, and to serve as a basis for further development of methods of hazard assessment (Author).

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AD-A090 942

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A080 942 CONTINUED

AD-A080 283

21/4

12/2

DESCRIPTORS (U) \*Water pollution, \*Mathematical models, \*Hydroxime, \*Spilling, Liquid rocket fuels, Hazardous materials, Pollutants, Streams, Lakes, Rivers, Estuaries, Water pollution abatement, Water treatment, Management, Planning and control, Hazards, Humans, Aquatic organisms, Toxicity, Concentration (composition), Chemical analysis, Diffusion, Diffusion, Time intervals, Mathematical analysis

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALE AFB FL  
ENGINEERING AND SERVICES LAB

(U) The Implications of Alternative Aviation Fuels on  
Airbase Air Quality

DESCRIPTIVE NOTE final rept Nov 77-Aug 80.

AUG 80

48P

IDENTIFIERS (U) Environmental impact assessment,  
MUNF:SCSAMSD02, P678001F

PERSONAL AUTHORS Scott, Harold A . Jr.,

REPORT NO AFESC/ESL-TR-80-38

PROJECT NO 2103

TASK NO 5A

UNCLASSIFIED REPORT

ABSTRACT (U) Aircraft alternative fuel emission factors from turbine engine combustor performance tests are integrated into the Air Quality Assessment Model (AQAM) to predict the air quality impact of alternative fuels use in the vicinity of military airbases. AQAM computes the alternative fuel emission factors from the combustor test data, enabling the model to predict concentrations for any proposed alternative fuel blend in addition to aircraft alternative fuel emissions calculations. AQAM was modified to calculate alternative fuel handling and breathing loss emissions from the fuel properties listing AQAM with two aircraft engine models, the aircraft alternative fuel annual emissions and resulting short-term pollutant concentrations are computed for a typical Air Force base. The analysis indicates that as alternative fuel emissions cause a slight increase in pollutant concentrations when compared with the baseline of fuel produced by evaporative hydrocarbon emissions, fuel predicted for the alternative fuels' lower volatility in comparison with JP-4 (Author)

DESCRIPTORS (U) \*Aviation fuels, Air quality, Air force facilities, Airports, Aircraft engines, Jet engine fuels, Concentration (Chemistry), Comparison, Models, Combustors, Emission spectra, Mixtures, Hydrocarbons, Air pollution, Volatility, Handling, Evaporation, Predictions, Dispersions, Computations

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A080 283 CONTINUED

IDENTIFIERS  
PE03732F (2) Alternative fuels, WUATSC2-035A38.

AD-A080 282 21/5 13/4 1/3

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) USAF Aircraft Engine Emission Goals A Critical Review  
DESCRIPTIVE NOTE Final Rpt Sep 70-Jun 70.

SEP 70 211P

PERSONAL AUTHORS Boubel, Richard W , Martone, Joseph A ,

REPORT NO AFESC/ESL TR-79-30

SUBJECT NO 1906

TASK NO 70

UNCLASSIFIED REPORT

ABSTRACT (U) This report is a comprehensive summary and analysis of proposed aircraft turbine engine air pollution regulations and their relevance to the USAF. Existing USAF aircraft turbine engine emission goals are critically reviewed, and revised goals are proposed. The original goals contained emission standards and compliance dates; the proposed goals contain neither. The authors believe that the goals should be set to provide an incentive for emission reduction and should not be numeric; standards and dates, which may or may not be met. The proposed USAF goals cover the critical turbine engine emissions: Carbon monoxide and oxides of sulfur, nitrate, white smoke and hydrocarbon emissions appear to warrant the high priority for reduction. Although cost effective oxides of nitrogen control (NO sub x) is viewed with pessimism, it is concluded that NO sub x reduction deserves continued USAF research. (Author)

DESCRIPTORS (U) Gas turbines, Turbo engines, Aircraft engines, Air pollution, Combustion products, Exhaust gases, Smoke, Hydrocarbon, Nitrogen oxides, Emission Planning Control, Environmental protection, Mathematical models, Atmosphere models, Stratophore Airports, Environmental impact statements

IDENTIFIERS (U) DACT(Best Available Control Technology, WUATSC19007001, PE03601F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A080 281 CONTINUED

AD-A080 281 7/3 21/9 1  
AIR FORCE ENGINEERING AND SERVICES CENTER TYNMALL AFB FI  
ENGINEERING AND SERVICES LAB

IDENTIFIERS (U) Autoxidation, Unsymmetrical  
Dimethylhydrazine Reaction vessels, PER2801F,  
DAI-FSC19002013

(U) The Vapor Phase Autoxidation of Unsymmetrical  
Dimethylhydrazine and 50-Percent Unsymmetrical  
Dimethylhydrazine - 10-Percent Hydrazine Mixtures

DESCRIPTIVE NOTE Final rept Jan 79 Oct 79.

APR 80 32P

PERSONAL AUTHORS Stone, Daniel A

REPORT NO AFESC/ESL-TR-80 21

PROJECT NO 1900

TASK NO 20

UNCLASSIFIED REPORT

**ABSTRACT** (U) The autoxidations of unsymmetrical dimethylhydrazine (UDMH) and a mixture of 50-percent UDMH and 50 percent hydrazine (50-50 blend) have been studied at pressures of several Torr in 44-cm reaction vessels and several ppm in a long path cell. With initial UDMH pressures of several Torr, autoxidation proceeded too slowly to be differentiated from natural decay processes. When the initial UDMH pressure was lowered to a few ppm, the addition of oxygen caused approximately first order decay with a half life of about 84 hours. The main hydride oxidation product under these conditions was formaldehyde. Dimethylhydrazine, the 50-50 blend and not formaldehyde, the oxidant systems, instead, there were substantial positive synergistic effects observed. At concentrations of a few Torr, the rate of oxidation increased about 10- to 20-fold increase in decay rate over that shown by UDMH or hydrazine by itself. At ppm concentration levels, the situation was similar for UDMH when a four-fold oxidation rate increase was observed when compared with a similar experiment with no hydrazine present. However, hydrazine oxidation in the 50-50 blend was somewhat slower than it was in a similar experiment with only hydrazine present (Author)

**DESCRIPTORS** (U) Hydrazine derivatives, Vapor phases, Oxidation, Automatic Mixtures, Rates, Hydrazine Oxygen Decay, Formaldehyde Reaction kinetics

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A069 093

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14/2

13/2

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

(U) Remote Atmospheric Measurements of CH<sub>4</sub> Using a LINBOC Tunable Source

DESCRIPTIVE NOTE Final technical rept Oct 78-Jun 79.

MAR 80

27P

PERSONAL AUTHORS Byer, Robert L., Endemann, Martin.

CONTRACT NO EPA-R-805750-01

PROJECT NO 1800

TASK NO 20

MONITOR AFESC/ESL  
(R-80-11)

## UNCLASSIFIED REPORT

**ABSTRACT (U)** A laser transmitter tuned by means of a lithium niobate optical parametric oscillator was employed to demonstrate the capability for remote measurement of gaseous pollutants in the atmosphere. Measurements of methane were obtained continuously over an 18-hour period with a precision of better than 0.08 parts per million. The long path measurements of methane were in excellent agreement with a Bay Area Pollution Control District point monitoring station. Capabilities of the tunable laser transmitter to measure other molecules, as well as atmospheric temperature, are discussed. (Author)

**DESCRIPTORS (U)** \*Tunable lasers, \*Remote detectors, \*YAG lasers, \*Neodymium lasers, \*Methane, \*Air pollution, Atmospheric temperature, Absorption spectra, Infrared spectra, Temperature measuring instruments, Lithium compounds, Niobates, Oscillators, Monitors

**IDENTIFIERS (U)** LIDAR, Lithium niobate, Optical parametric oscillator, PEGZBOIF, MUFESC19002007

AD-A089 993

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AF-A089 008 11/1 11/2 1/5

BATTIELE COLUMBUS LABS OH

(U) Polymer Research in Rapid Runway Repair Materials

DESCRIPTIVE NOTE Final rept Jan-Oct 79.

NOV 78

93P

PERSONAL AUTHORS Luttinger, Manfred; Kistler, Charles W.  
Dr. Gotta, Henry M., Sinclair, Richard G.

CONTRACT NO FGR035-79-C-0040

PROJECT NO ILIR

TASK NO 78

MONITOR AFESC/FSL  
TR-79-43

## UNCLASSIFIED REPORT

**ABSTRACT (U)** Low viscosity, two component epoxy resins were formulated for airless spray application over quartz dolomite aggregates. The formulation selected for full evaluation was based on mercaptan curing systems. Trifunctional acrylate monomers were used in some formulations as modifiers. The resulting polymer concrete set up within 3 to 4 minutes after mixing at temperatures around 73 degrees F. Good cures within 1/2 hour of mixing can be obtained in wet environments down to 5 degrees C and in dry environments down to -25 degrees C. Good adhesion to wet aggregates requires the use of coupling agents, organofunctional silanes being preferred. Good bonding to asphalt and portland cement concrete and good wear characteristics were demonstrated. Flexural strength properties are satisfactory after curing, both under dry and wet application conditions. While the polymer concrete is subjected to the exotherm of the curing reaction, flexural strength properties are low. (Author)

**DESCRIPTORS (U)** \*Runways, \*Repair, \*Concrete, \*Cements, \*Asphalt, \*Adhesives, \*Maintenance, \*Polymers, \*Curing, \*Adhesive bonding, \*Formulations (Chemistry), \*Mechanical properties, \*Epoxy resins, \*Silanes, \*Titanates

IDENTIFIERS (U) MUFESCILR7801, PEB1101F

AD-A089 608

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 045028

AD A090 280 CONTINUED

AD A090 280 14/2 21/5 13/2 ACUREX CORP MOUNTAIN VIEW CA ENERGY AND ENVIRONMENTAL DIV

(U) An Automatic Isokinetic Sampler for Particulate Emissions from Aircraft Gas Turbine Engines

DESCRIPTIVE NOTE Final rept Feb 75-Jun 76.

JAN 80 37P

PERSONAL AUTHORS Dehne, Hans Joachim.

REPORT NO ACUREX-78-315

CONTRACT NO N00123-75 C-1075

PROJECT NO 1900

TASK NO 2A

MONITOR AFSC/ESL, AESD  
11-80-04 181-01-80

UNCLASSIFIED REPORT

ABSTRACT (U) An automated isokinetic sampler for evaluating particulate emissions from aircraft gas turbine engines designed, constructed and tested. The engine exhaust gases are collected by a probe mounted on an aircraft gas turbine at the exit plane (non-sampling operation) for gravimetric measurements and particle size distribution. The particulate is collected on a fiber glass filter for gravimetric measurements. The size distribution is determined by conditioning the gas turbine exhaust gases and passing them through a mobility particle size distribution analyzer. The sampler has two-axis traverse capability and a maximum sampling capability of 228 l/min (8 acfm). Test data are automatically recorded. Control of the sampler is by means of a 12-bit microprocessor. Preliminary tests were performed at the Naval Air Research Facility, Alameda, California, at various construction stages of the sampler to evaluate its performance and to measure the effects of fuel additives on particulate emissions on a 1F41 gas turbine engine. (Author)

DESCRIPTORS: (U) \*Samplers, \*Emission, \*Particulates.

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DTIC REPORT CITIOGRAPHY

AD-A089 006 CONTINUING

IAC NO PL-037175

IAC DOCUMENT TYPE PLASTIC - MICROFILME --

IAC SUBJECT TERMS P--(U)Rueury repairs, Formulations, Epoxy, Repair, Spray applications, Adhesion, Bonding, Polymer concrete, Flexural strength, Hardener, Silanes, Coupling agents, Durability, Thermal conductivity, Epon 828, Araldite 508, Caydine WR, Epon 812, Cycloaliphatic, field repairs, Airfield pavements, Acrylic, Field, Cure monitoring, Polyamides 22 Unlimited.

SEARCH CONTING NO 055028

AD-A089 132 21/4 21/5

GENERAL MOTORS CORP INDIANAPOLIS IN DETROIT DIESEL ALLISON DIV

(U) Fuel Character Effects on Current, High Pressure Ratio Can-Type Turbine Combustion Systems

DESCRIPTIVE NOTE Final rept Jun 78-Jun 78

APR 80 183P

PERSONAL AUTHORS Vogel, Rodney E , Troth, Dennis L , Verdow, Albert J ,

REPORT NO DDA-EDR 9782

CONTRACT NO F33615-78 C 7008

PROJECT NO 3048

TASK NO 05

MONITOR AFAPL AFSSC/ESL TR-76-2072, TR-79-29

UNCLASSIFIED REPORT

ABSTRACT (U) The effect of limited fuel property variation on the performance of current, high pressure ratio, can-type combustors was evaluated. The T44 turbofan combustor was employed. This combustor has conventional, dual-orifice fuel injection and film cooling. The combustion zone is approximately stoichiometric at takeoff. Twelve experimental fuels, including JP-4 and JP-8, were tested. Distillation range, hydrogen content, and aromatic type were varied by blending JP-4 and JP-8 fuels with mineral seal oil and accomplished at idle, altitude cruise, dash, and takeoff conditions. Sea level and altitude ignition tests were also completed. Sea level and altitude ignition tests were characterized by established combustor operating parameters: inlet temperature, pattern factor, ignition fuel/air ratio, and combustor efficiency. Fuel and exhaust emissions were correlated to fuel properties. The effect of fuel properties on combustor and turbine hardware durability was assessed analytically. (Author)

DESCRIPTORS (U) \*Jet engine fuels, \*Turbofan engines

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AD-A089 182

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055026

AD-A089 182 CONTINUED

AD-A089 076 13/2 21/4 1/3

\*Combustion, Chemical composition, High pressure performance tests, Hydrogen, Aromatic compounds, Combustion, Smoke, Ignition, Emission, Carbon monoxide, Hydrocarbons Nitrogen oxides  
IDENTIFIERS (U) T4-41 engines, A 70 Attack aircraft A-7E Attack aircraft, JP-4 fuels, JP-8 fuels, Can type combustors, WUAFAPL304H0546, PEU2203F

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL ENGINEERING AND SERVICES LAB  
(U) Fuel Jettisoning by U S Air Force Aircraft Volume II Fuel Dump Listings

DESCRIPTIVE NOTE Final technical rept Feb 72-Dec 79,

MAR 80 184P

PERSONAL AUTHORS Clewell, Harvey J . III .

REPORT NO AFSC/ESL-TR-80-17-VOL-2

PROJECT NO 1800

TASK NO 4C

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume I, AD A089 010

ABSTRACT (U) An analysis of 3 1/2 years of data on fuel jettisoning by US Air Force aircraft was performed to provide the basis for an accurate assessment of the environmental effects associated with this practice. This volume contains complete listings of all reported fuel dumps by Air Force aircraft for the period 1 Jan 75 through 30 Jun 78 sorted by Air Force command and by aircraft. A third section presents the distribution of fuel jettisoning by latitude and longitude coordinates (Author)

DESCRIPTORS (U) \*Jet engine fuels, \*Jettisonable equipment, \*Air pollution, \*Environmental impact statements, Aircraft, Jet aircraft, Aviation fuels, Tables(Data) latitude, Longitude Emission, Hydrocarbons, Contamination, Geographical distribution

IDENTIFIERS (U) WUAFESC18094C02, PE6280CF

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## DTIC REPORT BIBLIOGRAPHY

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AD-AC89 010 13/2 1/3

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AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALE AFB FL  
ENGINEERING AND SERVICES LAB( Energy Conservation and Management Study of Aircraft  
Hangars at Selected Air Force Bases(U) Fuel Jettisoning by U S Air Force Aircraft Volume I  
Summary and Analysis

DESCRIPTIVE NOTE Final rept Jul-Dec 79.

DESCRIPTIVE NOTE Final technical rept Feb 72-Dec 79.

JAN 80 100P

MAR 80 80P

PERSONAL AUTHORS Leslie Mel: P

PERSONAL AUTHORS Clewell, Harvey J

CONTRACT NO F08635-79-C-0208

REPORT NO AFSC/ESL-TR-80-17-VOL-1

PROJECT NO 2803

PROJECT NO 1900

TASK NO 80

TASK NO 4C

ADMINISTRATOR AFSC/ESL  
TR-80-15

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, AD-A089 079

ABSTRACT (U) Most existing Air Force aircraft hangars were not originally designed to conserve energy according to present criteria. This study determines the sources of energy waste in hangars at three representative bases, quantifies the losses, and analyzes the economic feasibility of various retrofit ideas to reduce losses (Author)

DESCRIPTORS (U) Hangars, Energy conservation, Retrofitting, Economic analysis, Air force facilities, Energy management, Modification, Heat transfer, Space heaters, Radiant heating, Windows, Removal, Doors, Sealed system, Fans, Cooling and ventilating equipment

IDENTIFIERS (U) Air curtains, WUAFESC1038002, PCB3720F

AD-A089 075

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ABSTRACT (U) An analysis of 3 1/2 years of data on fuel jettisoning by US Air Force aircraft was performed to provide the basis for an accurate assessment of the environmental effects associated with this practice. The nature and extent of US Air Force jettisoning was examined, and the principal command aircraft locations, altitudes, and quantities were identified. The reasons for fuel jettisoning were also investigated, and the relative importance of fuel jettisoning as a source of hydrocarbon pollution was estimated, considering both the possibility of ground contamination by liquid fuel, and the potential for production of photochemical oxidant pollution from the vapors. The analysis indicates that current Air Force policies concerning fuel jettisoning are adequate to minimize any negative environmental consequences, and that Air Force operational practices are in keeping with these policies. Fuel jettisoning as carried out by Air Force aircraft does not appear to produce any serious environmental consequences (Author)

DESCRIPTORS (U) Aviation fuels, Jet engine fuels, Jettisonable equipment, Air pollution, Environmental impact statements, Hydrocarbons, Contamination

IDENTIFIERS (U) Fuel jettisoning, WUAFESC1000402, PCB3801F

AD-A089 010



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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A088 310 13/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALE AFB FL  
ENGINEERING AND SERVICES LAB

(U) Phenolic Wastewater Treatment Alternatives

DESCRIPTIVE NOTE Final rept Aug 79-Feb 80.

JUN 80 77P

PERSONAL AUTHORS Blum, Robert Q.

REPORT NO AFESC/ESL-TR-80 18

PROJECT NO 1800

TASK NO 70

UNCLASSIFIED REPORT

**ABSTRACT.** (U) The Air Force uses phenol compounds primarily in its paint stripping and carbon removal operations in the major portions of which are performed at the Air Logistics Centers (ALCs). Depending on the type operation, the spent phenol either enters the industrial/sanitary waste stream, or is removed and disposed of by a contractor. Several Air Force bases, particularly the ALCs, are experiencing difficulty in meeting increasingly stringent National Pollution Discharge Elimination System (NPDES) permit standards for phenols. In addition, new regulations being promulgated under the Resource Conservation and Recovery Act (RCRA) will impact upon the certain treatment and disposal practices theretofore. The principal objective of this study is to determine the most cost-effective procedures for the treatment and disposal of these materials in accordance with existing and proposed federal regulations. A literature review is presented which examines the following systems/processes: granular Activated Carbon (GAC) adsorption, ozone oxidation, hydrogen peroxide oxidation, potassium permanganate oxidation, iron (VI) ferrate oxidation, catalytic oxidation, chlorine oxidation, chlorine dioxide oxidation, aeration, recovery incineration, pyrolysis, landfilling, activated sludge, trickling filter and source control. The results of the cost analyses show that biological processes are by far the most cost-effective alternative for the treatment of paint stripping wastewater at the source. Biological systems are also the most cost-effective for treatment of

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AD-A088 310 CONTINUED

phenolic wastewater at the industrial or sanitary waste treatment plant, closely followed by ozone oxidation

**DESCRIPTORS** (U) Waste treatment, Disposal, Phenolic plastics, Waste water, Phenols, Activated carbon, Adsorption Catalysts, Incinerators, Oxidation, Activated sludge process, Aeration, Combustion, Ozone, Wastes (Industrial), Industries, Chlorine, Environments, Chemical cleaning, Paints, Cost analysis, Cost effectiveness

**IDENTIFIERS** (U) Paint stripping, PEO2401F, WC425C100070,1

IAC ID PL-061718

IAC DOCUMENT TYPE PLASTIC - MICROFICHE --

**IAC SUBJECT TERMS** P--(U) Process comparisons, Treatment plants, Cost analysis, Waste waters, Phenols, Activated Carbon, Carbon adsorption, Ozonation, Oxidation, Aeration, Trickling filtration, Incineration, Pyrolysis, Industrial wastes, Chemical wastes, Sanitary landfills, Biodegradation, Hazardous wastes, Paints, Sludge, ZZ MIDU, ZZ Unlimited

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

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AD-A068 834 13/2

SOUTHWEST RESEARCH INST SAN ANTONIO TX ENGINEERING  
SCIENCES DIV

SEARCH INC NORMAN OK

(U) New Concept Study for Repair of Bomb-Damaged Runways  
Volume I Concept Identification(U) Optimization and Test of the Ozone Cyanide Waste  
Treatment System at Tinker Air Force Base

DESCRIPTIVE NOTE Final rept 1 May 77-24 Jul 78.

DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.

SEP 79 1989

DEC 79 111P

PERSONAL AUTHORS Baker, E Jack, Jr, Berryman, Emmet P

PERSONAL AUTHORS Streibin, Lesim E, Schornick, Herbert M

REPORT NO 02-4891-VOL-1

CONTRACT NO FOA835-78-C-0205

CONTRACT NO FOA835 77 C-0154

PROJECT NO 2104

TASK NO 3W

TASK NO 2B

MONITOR AFSC/ESL

TR-79-48

MONITOR AFSC/ESL

UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, AD-8C50 055L

ABSTRACT (U) An in-depth review of bomb crater repair techniques and material resulted in the identification of twelve concepts. Each concept is a general solution to the problem of crater repair which is amenable to implementation using numerous combinations of fill and cup materials. In addition to the study and description of repair processes, an in-depth review of alternate runway strategies is presented (Author)

DESCRIPTORS: (U) Runways, Bomb damage repair, Spallation, Craters, Filling, Grapping, Materials, Protective covering, Damage assessment

IDENTIFIERS (U) Alternate runways, WJESL21042870, PEG3723F

AD-A068 188

AD-A068 834

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ABSTRACT (U) A full-scale demonstration plant utilizing ozone/ultraviolet radiation for removal of cyanide from electroplating wastes was optimized and tested at Tinker Air Force Base, Oklahoma. The original design goal was to reduce cyanide concentrations to nondetectable limit in a waste stream (825 gallons per hour) containing up to 5000 milligrams per liter cyanide. Study results are supplemented by a review of literature related to ozone oxidation. The report summarizes equipment operational and plant design deficiencies identified and corrected. Major problems included compressors breakdown, oil carry-over, inefficient air filters, inoperable dryers, inadequate ventilation, low power output from ozone generators and an inefficient ozone control system.

DESCRIPTORS: (U) Waste treatment, Wastes (Industrial), Wastewater, Ozone, Optimization, Test methods, Ultraviolet radiation, Oxidation, Air filters, Electroplating, Concentration (Chemistry), Generators, Stream, Compressors

IDENTIFIERS (U) PEG4798F WJAFSC20543W70

## UNCLASSIFIED

## OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD A080 385 13/8

AD A085 185 21/9 1

NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE

AIR FORCE ENGINEERING AND SERVICES CENTER TYNMALL AFB FL  
ENGINEERING AND SERVICES LAB

(1) Heating Technologies for Asphalt/Aggregate Mixtures

DESCRIPTIVE NOTE Final report Mar-Nov 79.

(U) The Effects of Amine Based Missle Fuels on the  
Activated Sludge Process

DEC 79 33P

DESCRIPTIVE NOTE Final report Jan 77-Jul 79.

PERSONAL AUTHORS Chastain, V

OCT 79 107P

REPORT NO 64892 AP-33

PERSONAL AUTHORS MacNaughton, Michael G ,Farmland, Jay A

CONTRACT NO F29601 70-C-2015

REPORT NO AFESC/ESI-TR-79-38

MONITOR AFESC/E2L  
TJ-80 01

PROJECT NO 2103

## UNCLASSIFIED REPORT

TASK NO 7W

## UNCLASSIFIED REPORT

ABSTRACT (U) This report investigates conventional and recently developed equipment and methods used in the heating and mixing of asphalt/aggregate mixtures. Recommendations are made for techniques to be developed which will meet the rapid repair time that is specified for microwave, solar, and conventional heating equipment. It is examined to determine the most feasible method to pursue for optimum heating and fuel conservation. (Author)

DESCRIPTORS (U) Asphalt, cements, heating, solar heating, energy conservation, mixtures, microwaves, pavements, runway, literature surveys, feasibility studies, mobile, heaters, life cycle costs

INVENTORS (U) Agnew, James

ABSTRACT (U) The Air Force (AF) procures amine based hydrazine fuels for use in Titan II and III, Minuteman I, II, Bomarc and F-105 systems and is also responsible for the procurement, storage, and transport of such fuels in support of the National Aeronautics and Space Administration (NASA) and the AF Space Shuttle Program. This report summarizes data on the effects of hydrazine (H<sub>2</sub>), Monomethylhydrazine (MMH), and Unsymmetrical dimethylhydrazine (UDMH) in conventional activated sludge systems for semi-continuous addition of waste containing the fuels and for slug doses from accidental spills. It was concluded from the continuous feed studies that the three hydrazines did not cause a significant reduction in the influent treated sludge plant if the concentration of the influent treated sludge plant is for an aeration basin with a common hydraulic detention time of 9 hours, the efficiency of organic removal is seriously degraded when the influent concentration of H<sub>2</sub> exceeds 10 mg/l. For UDMH and MMH this total failure results at concentrations of approximately 4 mg/l and 5 mg/l respectively. Interpolating from these continuous feed studies, the 'no effect level' would be approximately 1 mg/l for H<sub>2</sub> and 2 mg/l for MMH and UDMH. The influence of the hydrazines on nitrogen speciation of the sewage treatment plant effluent is more pronounced than that found for organic carbon oxidation. Inhibition of nitrification occurred at concentrations above 0.5 mg/l.

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AD A085 185

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A085 186 CONTINUED

1 for X084 and 1 mg/l for the other fuels

DESCRIPTORS (U) \*Aiming fuels. \*Guided missiles. \*Liquid rocket fuels. \*Activated fluida process. Hydrazine. Methyl hydrazine. Organic materials. Nitrogen. Storage. Accidents. Determination. Space shuttles. Spilling. Inhibition. Environments. Industrial plants. Carbon. Oxidation. Nitration. Sewage treatment

IDENTIFIERS: (U) Missile fuels. PER3723F.  
NAFESCI103784

AD-A084 788 13/8 20/7

ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND FORT MONMOUTH NJ

(U) Quartz Crystal Fabrication Facility

DESCRIPTIVE NOTE Final rpt 1 Apr 77-30 Sep 73 on Phase 1.

MAY 80 MSP

PERSONAL AUTHORS May, R J .

CONTRACT NO DE-AC04-76DP00830

UNCLASSIFIED REPORT

ABSTRACT (U) The report describes the design and construction of a five chamber, interconnected vacuum system, which is capable of cleaning, plating, and sealing precision quartz crystal units in a high vacuum flatpack enclosures continuously in a high vacuum environment. The production rate design goal was 200 units per eight hour day. A unique nozzle beam gold deposition source was developed to operate for extended periods of time without reloading. The source puts out a narrow beam of gold typically in the order of 2 1/2 dgs included cone angle. Maximum deposition rates are in the order of 400 a/min at 5:5 in 'throw' distance used. Entrance and exit airlock chambers expedite the material throughput, so that the processing chambers are at high vacuum for most of the conjunction with three vacuum manipulators, transport the individual chambers are normally separated from each other by gate valves. The crystal resonators, mounted in flatpack frames but unplated, are loaded into transport trays in a lid-frame-lid sequence for insertion into the system and exit as completed crystal units. The system utilizes waxybenzene coated ball bearings at essentially all friction surfaces. The gold sources and plating mask heads are equipped with elevators and gate valves, so that they can be removed from the system for maintenance without exposing the chambers to atmosphere.

DESCRIPTORS (U) \*Quartz resonators. \*Fabrication. Vacuum apparatus. Production control. Precision. Military applications. Specifications. Ceramic materials. Flat Pack Circuits Encapsulation. Cleaning. Plating

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AD A084 788

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IC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD A084 788 CONTINUED

Sealed systems industrial production  
Cryogenics, Cryocals

AD A084 783 13/8

HARCO CORP MEDINA OH

(U) Evaluation of Cathodic Protection, Criteria

DESCRIPTIVE NOTE Final rept Jul 79 Apr 79

DEC 79 8aP

PERSONAL AUTHORS Husock, Bernard ,

CONTRACT NO F08835 17 C-0240

PROJECT NO 2104

TASK NO 5C

MONITOR AFSC/ESL  
1R 78 14

UNCLASSIFIED REPORT

ABSTRACT (U) This report summarizes the results of a study undertaken to provide an in-depth evaluation of four principal cathodic protection (CP) criteria bases for underground and submerged metallic structures: all of the criteria considered make use of structure-to-soil potential measurements. The intent of the report is to provide the background necessary for selecting the proper criterion for a given situation and to remove the misconceptions which often arise. Guidance is provided for correct placement of the reference electrode with respect to the structure being investigated, and for determining how many potential measurements are sufficient. Explanations are given concerning the various voltage (IR) drops which are accounted and instruction is given on how those IR drops are to be considered. It must be understood that there are too many variables to allow for general, all-inclusive statements regarding criteria for cathodic protection. Each application must be reviewed individually using the experience from other similar applications together with the information in this report.

DESCRIPTORS (U) Cathodic protection, Pipelines  
Corrosion inhibition, Standards, Measurement  
Underwater structures, Underground structures, Metals  
Electrodes, Voltage

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AD A084 783

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 095028

AD-A084 783 CONTINUED

21/2 21/5

AD-A084 544 20/5 MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB

IDENTIFIERS (U) Corrosion, Pipe to soil protection  
Voltage drops, Metallic structures, Reference electrodes.  
PER3723F, MOESL 1045C01

(U) Remote Sensing of Turbine Engine Gases

DESCRIPTIVE NOTE Final rept 15 Jul 78-30 Sep 79.

SEP 79 84P

PERSONAL AUTOMORS Mooradian Aram, Kitzinger, Dennis K.  
Mehyuk NUREAN

CONTRACT NO F18828-78-C-0002

PROJECT NO 1900

MONITOR ESO AFESC/CSL  
78-79-319, TR 80 08

UNCLASSIFIED REPORT

ABSTRACT (U) This document is the final report for a laser remote sensing research program. The research conducted was designed to develop and demonstrate laser remote sensing techniques for monitoring jet aircraft exhaust gases. This effort was part of a larger program to develop remote sensing techniques for environmental monitoring and tactical detection and discrimination. The specific tasks which were performed consisted of the following: (1) development of an imager into a miniature CO<sub>2</sub> laser and detection system, (2) differential absorption of the frequency-doubled CO<sub>2</sub> TEA laser system, (3) laboratory measurements of laser system variables (GN and MO), and (3) initial field feasibility demonstration of laser remote detection of CO in vehicular exhaust (automobile, tractor power and Sky Crane helicopter) at ranges up to 2.9 km. Each of these tasks is described in detail in the following sections of this report. In addition, supporting documentation is included in the accompanying appendices.

DESCRIPTORS (U) \*TEA lasers, \*Carbon dioxide lasers, \*remote detectors, \*Exhaust gases, \*Jet engines, \*Carbon monoxide, \*Helicopter engines, \*Gas turbines, \*Automotive vehicles, \*Aircraft engines, \*Atmospheres, \*Atmospheric chemistry

IDENTIFIERS (U) Nitrogen oxides, Ethylene, Ozone

AD A084 544

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AD-A084 783

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 056028

AD-A084 544 CONTINUED

Methyl Nitrobenzene Carbonyls PER0301F

AD A084 426 13/2 21/3 1

AIR FORCE ENGINEERING AND SERVICES CENTER TYDALL AFB FL  
ENGINEERING AND SERVICES I&R

(II) Biological Degradation of Hydrazine

DESCRIPTIVE NOTE Final report Jun 77-Aug 78

OC: 76 40F

PERSONAL AUTHORS: MacNaughton, Michael D; Farquhar, Jay A;  
McDaniels, Larry; Hird, Gregory

REPORT NO AFESC/ESL-78-70 38

PROJECT NO 2103

TASK NO 7M

MONITOR CE3DO  
TR-78-19

UNCLASSIFIED REPORT

ABSTRACT (U) Due to the increased procurement, storage, and transportation of hydrazine (H<sub>2</sub>) in support of the Titan and Minuteman operational missiles, the Space Force, Phillips, and the Coastal Lighter Program, the Space Force Engineering and Services Laboratory has been tasked with determining the effects of fuel spills and low level, continuous flow discharges on publicly owned treatment works (POTW). Using 12 bench scale continuous flow recycle reactors, it was shown that treatment efficiency (as measured by COD removal) is not seriously impaired for plug doses which increase aeration basin H<sub>2</sub> concentrations up to 40 mg/l. Chemical oxygen demand (COD) recovery times for plug doses of 243 mg/l were approximately 4 to 5 days. Nitrification ceased at H<sub>2</sub> concentrations above 23 mg/l. The 'no effect' concentration with respect to ammonia oxidation was determined to be between 1 to 23 mg/l while nitrate recovery times for doses up to 243 mg/l were on the order of 10 days. Continuous influent H<sub>2</sub> concentrations above 10 mg/l seriously degrade COD removal capabilities. Nitrification under continuous feed conditions was inhibited above 1 mg/l.

DESCRIPTORS (U) Hydrazine; Activated sludge process; Air Force Facilities; Sewage treatment

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 095028

AD-A064 428 CONTINUED

AD A082 930 13/12

Concentration(Chemistry), Effluents, Continuous processing, Biodegradation, Inhibition, Biochemical oxygen demand, Degradation, Liquid rocket fuels, Spilling, Water pollution abatement, Bioassay, Toxicity, Ammonia, Recovery

NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER  
ATLANTIC CITY NJ

(U) Advanced Concept in Aircraft Crash Firefighting Using Carbon Tetrafluoride

IDENTIFIERS (U) Nitroreducer, Nitrosomonas, Fuel spills, Nitrication, PE63723F, WJNFSC21037194

DESCRIPTIVE NOTE Final rept Oct 77-Jul 79.

IAC NO PL-901719

MAR 80 108P

IAC OCCURRENT TYPE PLASTIC MICRO COPY

PERSONAL AUTHORS Goyer, George B ; Nori, Laurence M ; Urban, Charles H

IAC SUBJECT TERMS P- (U)Resource recovery, Toxicity, Biodegradation, Hydrazine, Liquid propellants, Hazardous wastes, Propellants, Effluents, CDD, RDD, Nitrication, Fuel spills, Pilot plants, Treatment plants, Industrial wastes, Sludge, Zz Mfdo, Zz Unlimited

REPORT NO FAA-NA-79-43

CONTRACT NO DTC-8-114

ADMINISTRATOR AFESC/PSL  
TR-79 40

## UNCLASSIFIED REPORT

ABSTRACT (U) The objective of this effort was to establish the feasibility of replacing a potentially lethal aircraft cabin environment with a cool habitable atmosphere which is noncombustive of combustion during passenger evacuation in fire emergencies. For this purpose, carbon tetrafluoride (CF<sub>4</sub>) was chosen as the fire extinguishant because of its very low toxicity and high molecular stability under thermal insult. Four large scale experiments were performed in the completely instrumented cabin of a DC7 aircraft emptying both Class A and B combustible materials. Three experiments were performed using the habitable inert atmosphere (27 volume percent CF<sub>4</sub>) discharging at the rate of 3,300 cubic feet per minute into the aircraft cabin through a window exit for comparative purposes. The fourth experiment was performed using heat exchanger cooled room temperature points of fuselage contraction built into the aircraft skin penetrator nozzle. Both of these methods of fire extinguishing systems were designed to be employed by airport crash fire-rescue services to extinguish aircraft cabin and compartment fires.

DESCRIPTORS (U) fire fighting, fire extinguishing agents, Carbon tetrafluoride, Aircraft cabins, Aircraft fires, Emergencies, Combustion, Crashes, Environments, Atmospheres, Feasibility studies, Thermal

AD-A064 428

AD A082 930

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AD-A002 938 CONTINUED

stability, Toxicity, Low level, Simulation, Rare gases  
IDENTIFIERS (U) Advanced systems, Advanced concepts,  
Cabin fire, Compartment fires

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055022

AD-A081 340 13/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALE AFB TX  
ENGINEERING AND SERVICES LAB

(U) Development of a Pavement Maintenance Management  
System Volume VII Maintenance and Repair Consequence  
Models and Management Information Requirements

DESCRIPTIVE NOTE Inform rep: Sep 77-Jul 79,

DEC 79 178P

PERSONAL AUTHORS Shahin, Mohammad Y ,Darter Michael, I ,  
Chen Thomas T ,

REPORT NO AFLE/ESL-TR-79-18-VOL 7

PROJECT NO 2094

TASK NO 20544P

UNCLASSIFIED REPORT

ABSTRACT (U) Statistical prediction models for pavement condition index (PCI) and key distresses have been developed for asphalt and jointed concrete pavements. The models were developed based on field data collected during 1978 through 1979 from 12 Air Force, Department of the United States. The field data included traffic, climate, pavement structural and material properties, and previous maintenance. Prediction models were developed for concrete and asphalt pavements, respectively. These models represent the first iteration of the consequence models needed to help pavement engineers select the most economical maintenance and repair (MAR) strategies and to help management efficiently allocate repair funds. Two workshops were held to determine information required by Air Force Command and Base engineers to efficiently manage airfield pavement MAR. The workshops were attended by many Command and Base engineers, as well as representatives from the Air Force Design Center and the Directorate of Management Systems. Computer and information requirements were defined and implementation alternatives for a computer aided pavement management system were developed as a result of these workshops (Author)

DESCRIPTORS (U) Pavements, Maintenance, Management  
Information Systems Models Repair Concrete, Asphalt

AD A082 340

AD A082 938

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A092 340 CONTINUED

AD-A081 707 13/8

Climate, Structures, Predictions, Requirements, United States, Formulas, Budgets, Computer Applications, Data Processing, Statistical Analysis

IDENTIFIERS (U) LPH-DTC-8-78, P294708F, WJAFESC-20544P1D

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Freeze Protection for Impressed-Current, Cathodic-Protection Anodes in Water Storage Tanks

DESCRIPTIVE NOTE Final rept Jan 78-Dec 78,

DEC 79 43P

PERSONAL AUTHOR Girard, Roger J ; Meyers, James R .

REPORT NO AFESC/ESL-TR-76-06

PROJECT NO 2102

TASK NO 40

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Rept no AFCEC-ER 75-6 dated Apr 75

ABSTRACT (U) A technique was developed for supporting anode assemblies from the bottom of water storage tanks using polyester-type fiberglass vertical columns. The columns were readily fabricated from the lightweight, non-metallic material; bottom-type anodes were easily positioned on the columns. The columns were supported in the tank by steel bases welded to the tank bottom. This was a unique departure from convention. Impressed-current type anode assemblies are conventionally suspended from the tank walls and are subject to damage during the winter if ice loading conditions. It was established that the non-metallic, bottom-supported anode system was a viable approach for supporting anode assemblies in water storage tanks where severe icing occurs. Horizontal supports should not be connected between the columns and the tank wall. Equally important, it was found that header cables to the anodes and permanent reference electrode assemblies could be effectively protected from ice damage by encasing them in polyvinyl chloride conduit anchored to the tank surface (Author)

DESCRIPTORS (U) \*Cathodic protection, \*Anodic coatings \*Freezing, \*Water tanks, Storage tanks, Ice formation, Roofs walls, Anodes, Fiberglass, Surfaces, Electrodes,

AD-A082 340

AD A081 707

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DTIC REPORT R18100P/PHY SEARCH CONTROL NO 055028

AD-A081 707 CONTINUED  
 Cables, Polyvinyl chloride  
 IDENTIFIERS (U) Freeze protection WUAFSC21024004  
 PB03723F  
 LAC NO PL-030178  
 LAC DOCUMENT TYPE PLASTIC - MICROFILM  
 LAC SUBJECT TERMS P--(U)Composites, Electrolysis, Storage tanks, Fiberglass/polyesters, Polyesters, Corrosion resistance, Belting, 72 Unfiled

DESCRIPTIVE NOTE In-orim rept Jan 77-Dec 78.

DEC 78 58P

PERSONAL AUTHORS Stapleton, Edward E , Nantz, Michael R .

REPORT NO AFSC/FSL-TR-70-34

PROJECT NO 2054

TASK NO 50

UNCLASSIFIED REPORT

ABSTRACT (U) This manual provides the installation procedures, theory of operation, and maintenance procedures necessary to install, operate, calibrate, maintain and understand the Solar Insolation Recording System (SIRS), which is a microcomputer-based data acquisition system used to collect solar insolation data. Traditionally solar data has been collected in an analog format (strip chart), large quantities of data were particularly difficult to manipulate. Therefore to simplify the processing of data, a data acquisition system was designed and built to interface with a computer. The data is stored on a cassette tape. In the case of SIRS, the data media is digital cassette tapes. These tapes can be read into a larger computer where complex data manipulation/processing can be accomplished. This document strictly addresses the data acquisition system. Data reduction and manipulation will be covered in the final technical report on Solar Radiation Measuring (Author)

DESCRIPTORS (U) Solar radiation, Data acquisition, Pyranometers, Integrators(Computers), Microcomputers, Digital recording systems, Data displays, Cassettes

IDENTIFIERS (U) WUAFSC20545008 PB04708F

AD-A081 707

AD-A080 404

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTINUED NO 054028

AD-A078 747 1/5

NMX MEXICO UNIT, ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY(U) Predicting the Fatigue Life of Flexible Airfield  
Pavements- A Recommended Approach

DESCRIPTIVE NOTE Final rept Jul 78-Jun 79.

JUL 79 123P

PERSONAL AUTHORS Decker, Dale S.

CONTRACT NO F28601-78-C-0015

PROJECT NO 2104

TASK NO 1A

MONITOR AFSC/ESL  
TR 78-28

## UNCLASSIFIED REPORT

ABSTRACT (U) The pavement engineer currently has no realistic means of predicting the fatigue life of an existing asphalt pavement or the service of a new asphalt pavement surface. The development of information that would enable engineers to make realistic fatigue life predictions, and thereby to make the best use of the increasingly scarce pavement maintenance dollar, is critically needed. This report reviews current fatigue and routine design test methods and examines the effects of materials and environmental conditions on fatigue life. The extensive literature review indicates a possibility that fatigue life may be estimated by correlating known fatigue parameters with results of routine design tests. The repeated load indirect tensile (fatigue) test and the resilient modulus indirect tensile (routine design) test are recommended for use in U.S. Air Force investigations.

DESCRIPTORS (U) Pavement; Fatigue life; Test methods; Asphalt; Life expectancy; Mathematical prediction; Loads (forces); Fatigue tests; Mechanics; Stress testing; Environment.

IDENTIFIERS (U) Aggregates (Materials); WUESI 21041023.  
PEG0720F

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AD-A078 558

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AD-A078 558 15/5 8/2

SRI INTERNATIONAL MENLO PARK CA

(U) User Guide for the Air Force Base Automotive  
Transportation Simulation Model - BATS Volume 3  
Documentation, Appendices D and E

DESCRIPTIVE NOTE Final rept Jun 78-Sep 78

SEP 79 223P

PERSONAL AUTHORS Sandys, Richard.

CONTRACT NO F08038-70 D 0132

MONITOR AFSC/ESL  
TR 78-18-VOL 3

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 1 AD-A078 325

ABSTRACT (U) For abstract see AD-A078 555

DESCRIPTORS (U) Air Force facilities; Ground traffic; Air quality; Exhaust gases; Computerized simulation; Computer programs; Output; Oklahoma; Arizona.

IDENTIFIERS (U) Tanker Air Force Base Davis-Monthan Air Force Base; BATS Base Automotive Transportation Simulation; AQMT (Air Quality Assessment Model).

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055025

AD-A070 555 15/5 9/2

SRI INTERNATIONAL MENLO PARK CA

(U) User Guide for the Air Force Base Automotive Transportation Simulation Model - BATS Volume 2 Documentation

DESCRIPTIVE NOTE Final rept Jun 78-Sep 78.

SEP 78 34RP

PERSONAL AUTHORNS Sandys, Richard.

CONTRACT NO F08035-78-D-0132

MONITOR AFSC/ESL  
TR 79-10-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, Appendices D-E AD-A070 556

ABSTRACT (U) The Bats Automotive Transportation Simulation (BATS) Model is a transportation planning and traffic flow model designed to simulate traffic volumes and flows on an Air Base. The Principal Model Inputs are a road network, land use zones, demographic data, and gate counts. The land use zones, demographic data, and gate counts are used to assign traffic volumes to the road network, and these volumes are used to calculate the flow of traffic on each road in the network. The flow of traffic on each road in the network is simulated using the volumes assigned. Average speed and volumes are the results of the model, and these may be directly input to the Air Quality Assessment Model (AQAM) to estimate pollutant emissions and dispersion from traffic sources. A volume flow plot of the network is an optional output of the model. (Author)

DESCRIPTORS (U) Air Force facilities; Ground traffic; Air quality; Exhaust gases; Computerized simulation; Data reduction; Input Computer programs; Sub-routines; Computer program documentation

IDENTIFIERS (U) BATS (Base Automotive Transportation Simulation); AQAM (Air Quality Assessment Model);

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AD A070 413 0/10

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDAL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Physiological limits of firefighters

DESCRIPTIVE NOTE Final rept Oct 77-Jan 79

JUN 78 84P

PERSONAL AUTHORS Hyde L O, Holden, R D, Dunbar, R. H., Lucken D.

REPORT NO AFSC/ESL-TP 73-08

PROJECT NO 414N

TASK NO 30

UNCLASSIFIED REPORT

ABSTRACT (U) The U S Air Force School of Aerospace Medicine conducted a study of respiratory stresses imposed on firefighters. The purpose of this study was to determine the physiological limits of firefighters and to develop a model for the purpose of predicting the changes in work capacity accompanying the wearing of a self-contained breathing apparatus (SCBA). Twenty volunteer subjects, ranging in age from 25 to 49 years, participated in the study which included both aerobic and anaerobic work. The subjects were fitted with a 30 minute SCBA, equipped with a full face mask and either a (1) demand, or (2) pressure demand regulator, was worn by the subjects while walking on a motor driven treadmill at a constant speed (3.3 mph) and up grades determined to require 50, 65 and 80 percent of each individual's aerobic capacity (VO2 max) following a 10 minute rest. Venous blood was drawn for Hb, Hct, % CO2, and lactate determinations. The subject then began a 10 minute bout of work at one of the three work levels given above. Measurement monitored continuously during work included heart rate, respiratory rate, work rate, temperature, maximum and minimum CO2 and CO2 tensions inside the mask, breathing resistance (pressure), and heart rate (EKG).

DESCRIPTORS (U) Stress (Physiology); Fire fighting; Breathing apparatus; Respiration; Physiological effects; Physical fitness; Heart rate; Electrocardiography

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OTIC REPORT 0181 IGGRAPHY SEARCH CONTROL NO 055023

AD A079 413 CONTINUED

IDENTIFIERS (U) Firefighters LBN-AFCEC-77 100.  
WUAF06C41ND0007 PEO75147

AD-A079 328 15/5 5/2

SRI INTERNATIONAL MEMO PARK CA

(U) User Guide for Air Force Base Automotive  
Transportation Simulation Model -BATS Volume 1 Data  
Collection and Reduction

DESCRIPTIVE NOTE Final rept Jun 78-Sep 79.

SEP 78 180P

PERSONAL AUTHORS Cuffey-Armstrong, Marilyn, Snodde, Susan,  
Sandys, Richard,

CONTRACT NO F08635 78-D-0132

MONITOR AFSC/ESL  
TR-79-1B-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, AD-A079 855

ABSTRACT (U) This user guide describes the collection  
and preparation of information required by the Base  
Automotive Transportation Simulation (BATS) Computer  
model. The BATS model predicts traffic volumes on an Air  
Force installation's road network using anderson,  
transportation and demographic data. The data collection  
procedure is presented in step-by-step format with  
information sources clearly identified. The data  
collection procedure is divided into discrete tasks so  
that the information can be collected at different time  
periods. A master checklist enables a supervisor to  
efficiently manage the data collection tasks for the  
personnel available. The entire data reduction and  
encoding procedure to create a BATS input computer card  
deck is also explained. (Author)

DESCRIPTIONS (U) Air Force facilities, ground traffic,  
computerized simulation, input, data reduction, coding,  
punched cards

IDENTIFIERS (U) BATS(Base Automotive Transportation  
Simulation)

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AD-A079 328

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AD 1274 71P 1/15 12/13 13/2 AU 1078 770 (U) UNCEED 18007000 PER280 F  
 OPTIC REPORT BETHLEHEM ST. ROCK CONTROL NO 015026  
 ENHANCEMENT ENGINEERING CONSULTANTS GAINESVILLE  
 (U) Actual Filter Loading Rate for a Simulated Jet Engine  
 Test Cell (TR-70)

DESCRIPTIVE NO. Final Test Jan 11 '70.

NO. 18 43P

PENNSYLVANIA AUTOMOBILES, Langhorne, Date A

COMPARISONS NO. FORM 17-70-M-O 84

PROJECT NO. 1800

7/ASX NO. 70

MONITOR AFSC/ESL  
 TR-70 28

UNCLASSIFIED REPORT

ABSTRACT (U) The Air Force routinely tests turbine engines in fixed test cells, some of which have been cited by state pollution control officials for violations of opacity regulations. A previous theoretical study, CEEDG TR-78-53, predicted that relatively low efficiency and low cost techniques could bring jet engine test cells into compliance with air pollution regulations. The system proposed included a water cooling spray and a mist eliminator followed by a medium efficiency, high velocity throw away type glass filter media. The most serious limitation of which velocity filtration is the aerosol loading rate. Potential for rapid pressure drop build up and the resulting high maintenance costs. The study characteristics could not be theoretically predicted, the objective of this follow-on work was to experimentally test and report the filter loading characteristics of glass fiber filters for possible application to jet engine test cell exhaust plume opacity control. Two types of glass fiber media were tested (1) two different medium efficiency pre filter media and (2) two different high efficiency fine filter media.

DESCRIPTORS (U) Engines, Test facilities, Air pollution, Filters, Glass fibers, Pollution abatement, Smoke Aerosols, Opacity, Sprays

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AD 1078 770

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211C REPORT BIBLIOGRAPHY SEARCH CONTROL NO 05023

AD-A078 440 21/5 21/4

GENERAL ELECTRIC CO CINCINNATI OH AIRCRAFT ENGINE GROUP  
(U) Evaluation of Fuel Character Effects on J79 Engine  
Combustion System

DESCRIPTIVE NOTE. Final technical rept 7 Jun 77-31 Aug 75.

JUN 78 188P

PERSONAL AUTHOR: Gleason, C G. Siller, T L. Shavess, R W. Bahr, D W.

REPORT NO. R79AG321

CONTRACT NO FC3618 77-C-2042

PROJECT NO 2045

TASK NO 05

MONITOR AFAPL/AFEDU TR-79-2015, 74-79 06

UNCLASSIFIED REPORT

AUSDACT (U) Results of a program to determine the effects of broad variations in fuel properties on the performance, emission, and availability of the J79-17A turbojet engine combustion system are presented. Computer tests conducted at engine (a) takeoff, subsonic cruise, supersonic dash, cold dry ground start, and altitude reflight operating conditions with 13 different fuels are described. The fuel fuels covered a range of hydrogen content (10 to 14.5 percent), aromatic type (monocyclic and bicyclic), initial boiling point (265 to 385 K), final boiling point (552 to 678 K) and viscosity (0.05 to 0.28 mm<sup>2</sup>/s at 400 K). At high power operating conditions fuel hydrogen content was found to be a very significant fuel property with respect to linear temperature flame retardation and NO sub x emission levels. Critical monolith all of the fuel At engine idle operating conditions CO HC, and NO sub x emission levels were found to be independent of fuel hydrogen content, but a small effect of fuel volatility and viscosity was found. At cold dry ground start conditions (to 328 K) lightoff was obtained with all

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DESCRIPTORS (d) Turbojet engines, Jet engine fuels, Oil fuel fuels, Combustion, Aircraft engines, Physical properties Boiling point, Nitrogen oxides, Emission, Fuel air ratio, Life expectancy  
IDENTIFIERS (u) J-79-17A turbojet engines, PER2203F, IMP/APL30180581

AD-A078 440 CONTINUED

fuels, but the required fuel-air ratio increased with the more viscous fuels. At altitude conditions, the current engine reflight limits with JP-4/JP-5 fuel were essentially met or exceeded with all of the JP-4 or JP-5 based fuel blends. However, a very significant reduction in altitude reflight capability was found when a NJ 2 diesel fuel was tested.



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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 255078

AD-A078 118 10/3

NEW MEXICO INST ALBUQUERQUE ERIC H WANK CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Survivability of Remote Site Alternate Energy Systems  
Volume 2. Survivability Analysis

DESCRIPTIVE NO: E Final rept Sep 78-Mr 78.

SEP 78 147

PERSONAL AUTHORS Schuch, Karl E .Bairstown T .

CONTRACT NO F28801-78-C-0015

PROJECT NO 2103

TASK NO 80

MONITOR AFSC/ZSL  
1R-78-21-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2. AD-0042 322L

ABSTRACT (U) As a result of increasing fuel costs and decreasing reserves, the USF is studying the possibility of providing power to remote sites by means of alternate energy sources. Remote sites are identified and categorized. Several alternate energy sources are examined with respect to reliability, maintainability, survivability against natural and man-made threats. Energy storage devices are also studied, and a final decision matrix is developed which relates these findings (Author)

DESCRIPTORS (U) Power supplies. Solar cells. Electric batteries. Auxiliary power plants. Survival (General). Remote areas. Early warning systems. Threats. Reliability. Maintenance. Cost-benefit analysis. Meteorological data. Remote sites. Systems analysis. Long range (time). Operation. Acquisition. Feasibility studies. Gallium arsenides. Photovoltaic effect. Fuel

IDENTIFIERS (U) Survivability analysis. Alternate energy systems. Gallium arsenide batteries. Photovoltaic cells. WUESL2103R008 P88372F

AD-A078 118

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AD-A077 866 21/4 21/1

GENERAL ELECTRIC CO CINCINNATI OH AIRCRAFT ENGINE GROUP  
(U) Evaluation of Fuel Character Effects on J40 F-01  
Engine Combustion System

DESCRIPTIVE NOTE Final technical rept 1 Aug 77 LO 30p  
76.

JUN 78 199P

PERSONAL AUTHORS Gleason, O C .Oiler, J L .Shayson  
M W .Bah-D W .

REPORT NO R79AE0405

CONTRACT NO F33615-77-C-2043

PROJECT NO 2048

TASK NO 05

MONITOR AFAPL GEICO  
1R-79-2018, 1R-79-07

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE Includes Addendum

ABSTRACT (U) Results of a program to determine the effects of broad variations in fuel properties on the performance, emissions and reliability of the General Electric F401 augmented turbofan engine main combustor system are presented. Combustor rig tests conducted at engine speeds of 100%, 80%, 60%, and 40% at 1500, 1400, 1300, and 1200 RPM, cruise, dash, cold day ground start altitude, and light operating conditions with 13 different fuels are described. Fuel nozzle fueling tests conducted with two same fuels are also described. The test fuels covered a range of hydrocarbon content (12.0 to 14.5%), aromatic type (noncyclic and bicyclic), initial boiling point (285 to 383 F), final boiling point (450 to 678 K) and viscosity (1.83 to 3.25 millimetric/25.1 300 K). At 1400 RPM power conditions, fuel hydrocarbon content was found to have a very significant effect on engine temperature, torque, and NOx levels. At 100% engine levels, decreased with increasing hydrocarbon content. The levels were very low with all fuels. At idle conditions, CO and HC levels correlated with fuel atomization/volatility parameters, but showed no relationship to hydrogen

AD-A077 860

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A077 800 CONTINUED

content Cold dry ground start and altitude weight also correlated with fuel atomization parameters. Fuel atomization parameters were determined for various engine conditions but showed no dependence on hydrogen content. Linear life analyses yielded relative life predictions of 1.00, 0.7, 0.52, and 0.47 for fuel hydrogen contents of 14.5, 14.0, 13.0, and 12.0 percent, respectively. At the present state of turbine stator development, no fuel effect on life is predicted. Extended cyclic fuel nozzle valve gunning tests revealed significant effects of fuel type and temperature on nozzle life. The results correlated with laboratory thermal stability ratings of the fuels based on tube deposits alone. (Author)

DESCRIPTORS: (U) Jet engine fuels, Combustion, Test methods, Thermal stability, Chemical analysis, Physical properties, Cyclic test, Parameters, Life expectancy, Compositions, Combustors, High pressure, Viscosity, Combustion products, Carbon black, Nozzles, Valves, Experimental data, Hydrogen, Emission, Smoke, Cold weather tests

IDENTIFIERS (U) Combustion parameters, PB82203F, UNAF/PL304805B4

AD-A075 947 13/2 21/5

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALE AFB FL  
ENGINEERING AND SERVICES LAB

(U) Control of Particulate Emissions from Turbine Engine  
Test Cells by Cooling Water Injection

DESCRIPTIVE NOTE Final rept Feb-May 70.

JUL 70 77P

PERSONAL AUTHORS MacNaughton, Michael G. Terquinio,  
James J. Martone Joseph A. ;

REPORT NO AFSC/ESL/TR-78-18

PROJECT NO 1900

TASK NO 20

UNCLASSIFIED REPORT

ABSTRACT (U) The operation of DOD turbine engine test cells in California has been criticized by the State environmental regulatory agencies because smoke generated by some engines results in excessive opacity (visibility) of the test cell exhaust plume. Since the plume exceeds visibility standards for only a relatively small proportion of engines tested a low cost control technique which brings the test cell into compliance with opacity standards is required. This study was initiated to verify that, in addition to forming a steam plume, water used to cool the test cell walls also removes engine generated particulates and substantiates this procedure as a legitimate pollution control technique. It can be concluded from this study that water injection as practiced at McClellan AFB test cell results in significant (approx 50% by weight) control of turbine engine particulate emissions. It is postulated that the process could be made more efficient by the use of better designed spray nozzles which would increase water droplet particle contact and inclusion of a demister to increase water removal from the exhaust.

DESCRIPTORS (U) Air pollution control equipment, Turbojet engines, Exhaust plumes, Water injection, Test equipment, Particulates, Air pollution, Environmental impact statements, Emission, Spray nozzles, Water cooling

AD-A077 800

AD A075 947

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD AOTS 947 CONTINUED

AD AOT 870 21/2 21/4 7/2

DAYTON UNIV OHIO

ID. NTETEPS (U) PE02001F MUESI 19002018

(U) Soot Control by Fuel Additives - A Review

DESCRIPTIVE NOTE Final technical report 1 Jun 1 Oct 78

SEP 78 41P

PERSONAL AUTHORS Howard, Jack B. Kausch, William J. Jr.

CONTRACT NO F33815-77-C-2089

PROJECT NO 3685 1900

TASK NO 41. 40

MONITOR AFESZ/ESL  
TR 78-32

UNCLASSIFIED REPORT

ABSTRACT (U) A review of studies conducted in practical combustion systems such as oil-fired domestic and utility boilers, gas turbines, and diesel engines has demonstrated that metallic fuel additives can be effective in reducing soot emissions. Manganese, iron, and barium compounds are the most commonly used highly effective, although problems with metal oxide deposits on combustor surfaces sometimes prohibit their use. Evaluation of laboratory burner flame experiments revealed three distinct mechanisms by which the various metallic additives function to remove soot. Several mathematical models of soot reduction through additive use are discussed. Iron additives and their combustion products are relatively non-toxic, whereas the popular manganese additives and their oxides are highly toxic. Generally only water soluble barium compounds are used, and these typically constitute only 25 percent of the barium compounds in diesel engine exhaust. Additives are only recommended for short term use; combustor design modifications being the economically preferred long term solution. (Author)

DESCRIPTORS (U) \*Smoke, \*Control \*Additives, \*Fuel \*Additives, \*Combustors, \*Combustion deposits, \*Combustion \*Additives, \*Combustion products, \*Boilers, \*Gas turbines, \*Diesel engines, \*Metal compounds, \*Reduction, \*Oxides, \*Emission, \*Manganese, \*Barium, \*Iron, \*Mathematical models, \*Hazards

AD AOT 870

AD AOTS 947

PAGE 114 055028

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DVIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A074 870 CONTINUED

Toxicity

IDENTIFIERS (U) Soot control, Soot control additives  
Metal oxides, Metallic fuel additives, Soot emissions,  
PE02801P W05SL7804003, PE02203P, W05SL305591

AD-A074 860 10/2 10/3 10/1  
DAYTON UNIV / AND SCHOOL OF ENGINEERING

(U) Analysis of Remote Site Energy Storage and Generation  
Systems

DESCRIPTIVE NOTE Final technical rept Jul 78-Jun 79,

JUL 79 148P

PERSONAL AUTHORS Crisp, J N , Bishop, W S , Pinson, J D  
Anderson, L A ,

REPORT NO UDR-1R-79 35, UDSE-TR-79-02

CONTRACT NO FJ015-77-C-7004

MONITOR AFESC/ESL  
TR 79-20

UNCLASSIFIED REPORT

ABSTRACT (U) This report presents the results of an investigation and analysis of energy storage systems and alternate energy sources for remote site applications. The first phase of the effort centered on the broad based study of hydrogen storage, thermal storage, batteries, and flywheels as energy storage systems along with wind turbine solar photovoltaic and solar thermionic energy converters. A wind turbine battery system was recommended based on performance, cost and availability. Effort under the second phase of the program concentrated on a system using two separate nominal eight kilowatt wind turbine motors in conjunction with C<sub>14</sub> acid battery energy storage unit. The system was specified to operate in conjunction with an existing power grid system located at Bar Main, Barter Island, Alaska. Specific operating concepts and recommendations are presented. The final analysis and design details is included with specific item for consideration in the preparation of a design specification (author)

DESCRIPTORS (U) \*Electric power production \*Wind machines, \*Energy storage, \*Storage batteries, Remote areas, Turbogenerators, Performance Engineering, Cost analysis, Operational readiness, Experimental design, Comparison, Solar energy, Thermal power plants, Hydrogen oxygen fuel cells Thermionic power generation, Photovoltaic effect

AD A074 855

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AD A074 870

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY	SEARCH CONTROL NO	CONTINUED
	11/3	AD A073 990
	13/2	AD A073 990
		CONTINUED

TRINITY 1841V SAM ANTONIO TX LA3 OF CELLULAR PHYSIOLOGY

Biodegradation of Phenolic Paint Stripping Waste  
Laboratory Evaluation of a Fixed Film Batch Reactor

DESCRIPTIVE NOTE	Final rept	Oct 77	Jan 79
MAR 76	FILED		
IDENTIFIERS (U)			
P68723F			
Paint stripping wastes, WUESL21037W7.			

PI - 821489

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PLASTIC - MICROFICHE -	IAC DOCUMENT TYPE	PLASTIC - MICROFICHE -

INC SUBJECT TERMS	P- (T)Treatment plants. Pilot plants
Biodegradation, Paints, Coatings, Primers, Phenolic.	
Waste waters, Polyurethanes, Epoxy, Trickling filtration	
Toxicity, Effluents, Industrial wastes, Fixed beds, 72	
MIDP 72 Unlimited.	

## UNCLASSIFIED REPORT

at RALY. (ii) JSAF aircraft and ground support equipment while the protection of amble epoxy-polyurethane surface coatings. Maintenance of such painted surfaces has long involved the use of solvents containing thinners has created a disposal problem that is aggravated by the low reactivity of large aircraft decontaminating agents. The present investigation studied performance of a water-based, dedicated function, tickling filter type biodegradation unit. The specific waste target was the concentrated phenolic waste water produced at the Kelly AFB decontamination facility. Three filter units at the Kelly AFB decontamination facility were selected for testing. The first unit was located at the Kelly AFB decontamination facility, San Antonio, TX. Experiment units were run examining solid support media choices, bed length and volume, ventilation requirements, hydraulic surface loading, phenol concentration and loading rate kinetics, retention tolerance, starvation responses and temperature effects. It was the intent to determine the effects of a changing environment/temperature cycles subjected to a changing media composition. The second unit was selected for a closed community better able to cope with occasional filter change in this cycle. A thin film reactor conserves the space of its adapted community more efficiently than other reactor types. The data summarized in this report suggests that a batch fixed film process may have advantages over other biological unit processes for some

AC-73 8388

AD A07J 998

3-15 045028

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A073 880 11/9 1/5 CONTINUED

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TRINIDAD AIR FL DETACHMENT 3 (ADIC)

(U) Resin Concrete from Bomb Damage Repair of Airfield  
Pavements

DISCUSSIVE NOTE Final rpt Jan 76-Feb 77 on Phase 1.

NOV 77 101P

PERSONAL AUTIZORS Smith, Alvin .

REPORT NO CEEDU-TR-77-53

CONTRACT NO NIPR-FOREST 74-80007

UNCLASSIFIED REPORT

ABSTRACT (U) This study was Phase 1 of a two phase study and was conducted to determine whether commercial liquid resins can be used successfully as binders on matrix materials with aggregates to form resin concrete for rapid repairing small damaged areas in airfield runway pavements. One type of resin system, a highly reactive epoxide resin, was chosen to have the necessary properties. It came nearest to meeting all of the study objectives, including aggregate penetration, polymerization rate, early strength development, ease of application, and cost to meet all of the design objectives. Further studies of the identified material should focus on (1) material improvement in the areas identified as having performance weaknesses (e.g., bonding to wet aggregates), (2) repair patch designs which relate to composite material properties to patch size and substrate support quality, and (3) evaluation equipment criteria and design. However, the sponsoring agency recommends that new concepts be investigated rather than continue with further work on this particular resin system (Author)

DESCRIPTORS (U) Runways, Pavements, Airports, Standing Fields, Composite materials, Reinforced concrete, Polymer binders, Bomb damage repair, Environmental design, Bonding, Performance tests, Air Force facilities

IDENTIFIERS (U) Resin concrete Polymer concrete

AD-A073 880

AD A073 880

UNCLASSIFIED

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IAC NO PL-034483  
IAC DOCUMENT TYPE PL-034483  
IAC SUBJECT TERMS P- (U)Paving, Polyesters, Repair, Polymer concrete, Concrete, Airfields, Runways, Binders, Polyurethanes, Acrylic epoxy, Furnaces, Soil stabilization, Testing, Physical properties, Aggregate, Beam tests, Adhesion, 22 Unlimited

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AD A073 879 1-5 13/3 DYC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD A073 431 9/1 17/4 13/8 10/1  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB

(U) Corrosion Control of Hardened Intersite Cable System  
 (HICS) Splice Case

DESCRIPTIVE NOTE Final rpt Dec 78-Aug 78

JUL 78 101P  
 PERSONAL AUTHORS Rom, C L, Sullivan, A L, III  
 Shamburger, J W

PROJECT NO 2104

TASK NO 2B

MONITOR CEEDO  
 TR 78-45

UNCLASSIFIED REPORT

ABSTRACT (U) A literature review was conducted to determine soil and rock types in various European and Middle Eastern countries, and the results are shown in Appendix A of this report. A study was conducted to evaluate the performance of selected materials used for constructing contingency airfield sections consisting of combinations of compacted aggregate, lean clay, and lean clay. Four tests were conducted on a prepared lean clay course with a rated CBR of 10 with thickness of base courses over the subgrade determined from present criteria and a road surface over all items

DISCUSSIONS (U) Runways Construction materials Road mechanical S-11 tests, Repair Vulnerability, Test and evaluation Maintenance, Combat support

IDENTIFIERS (U) F 4C aircraft, F63723F, WDCUED031042825 (PN CEED0-77 018

AD A073 678

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AD A073 431

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UNCLASSIFIED REPORT

ABSTRACT (U) Several thousand splice cases are in use on the hardened intersite cable system between the Strategic Air Command's Minuteman sites. These splice cases are exposed to severe galvanic corrosion caused by interconnection with the graphite impregnated polyethylene cable sheath which acts as a large cathode. The Air Force Civil Engineering Center conducted laboratory and field tests to determine the magnitude of corrosion for the three different splice cases in use and to develop the surface potential criteria necessary to achieve adequate cathodic protection (CP). Test results showed that aluminum splice cases fail quicker than cast iron, and that bronze splice cases with bronze connecting hardware experienced little corrosion. The application of dissimilar metals (graphite and alloy cases) resulted in the surface potential criteria being significantly different from the S-11 CP criteria of either a - 85 volt surface potential or a negative 300 millivolt shift for a surface potential of - 55 volt or a negative 400 millivolt shift, whereas the cast iron splice case required a surface potential of - 34 volt or a negative 510 millivolt shift. The revised surface potential criteria and the procedure developed to determine the degree of corrosion can be used on any underground metallic system with dissimilar metals (Author)

DISCUSSIONS (U) Electric cables, Splices Packaging

## UNCLASSIFIED

D1C REPORT BIBI TOORAPHY

SEARCH: CONTROL NO 055028

AD-A072 249 17/2 1

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

AD A071 802 14/2 13/2 14/5

WASHINGTON UNIV SEATTLE REMOTE SENSING APPLICATIONS LAB

(U) Individual Fire Fighter Communications

(U) Study in Remote Sensing for Land Use

DESCRIPTIVE NOTE Final rept Oct 78 Jul 78.

DESCRIPTIVE NOTE Final rept Apr 77-Jun 78.

MAR 79 48P

JUN 79 74P

PERSONAL AUTHORS Knowles, Norman O.

PERSONAL AUTHORS Shinn, Richard D ; Westerlund, Frank V.

REPORT NO AFESC/ESL TR-78-04

CONTRACT NO F08035-77-C-0278

PROJECT NO 414N

PROJECT NO 2193

TASK NO 30

TASK NO 9P

UNCLASSIFIED REPORT

MONITOR AFESC/ESL  
TR-78 15

ABSTRACT (U) The Engineering and Services Laboratory (ESL) conducted an evaluation to fulfill an operational requirement for an individual, two-way communication system for fire fighters. Contracts were initiated in April 1977 to obtain the basic radios and as a result of this procurement action, integrated systems were bought and installed. The accessories included a few type hood, helmet, breathing system. This new hardware was tested because it appeared to offer the greatest potential for replacing units with in the United States Air Force. The primary objective of the equipment evaluation was to provide a procurement description (specification) of the items of equipment needed to satisfy the operational requirement so that authorization documentation could be developed or revised.

DESCRIPTORS (U) radio equipment, Communication and radio systems, Reportable equipment, Air force equipment, Fire fighting equipment, Rescues, Rescues equipment, Safety equipment

IDENTIFIERS (U) NAATCSCIAN3003, PB84774F

UNCLASSIFIED REPORT

ABSTRACT (U) This research tested three methods of obtaining land use information by remote sensing for the United States Air Force (USAF) land use planning. The three methods tested were (1) photo interpretation of aircraft photography, (2) groundstereometric processing of aircraft photography, and (3) statistical analysis of Landsat digital data. The two sites tested were McChord AFB and Fairchild AFB, Washington State. Using test scenarios of mission realignment, it was found that photo interpretation was an accurate and ready means to obtain land use information (Author)

DESCRIPTORS (U) Remote detectors, Land use, Urban planning, Photo interpretation, Image processing, Cathode ray tubes, Air force planning, Aerial photography, Land areas, Optical equipment

IDENTIFIERS (U) Remote detection, Land use, NAATCSCIAN3004, PB03727F

AD-A071 802

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REF 17C 055028



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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A073 431 CONTINUED

Galvanic corrosion, Cathodic protection, Ground corrosion, Leaching sites, Underground corrosion, Graphite, Polyethylene, Bronze, Aluminum, Iron

IDENTIFIERS (U) Hardened intersite cable systems, Surface potential, Splice cases PE347057, WUCED020544C15

TAC NO METC 126718

TAC DOCUMENT TYPE MIC - HARD COPY --

TAC SUBJECT TERMS M (U)Country USA, Corrosion, Galvanic Corrosion, Cathodic, Ground, Addition, Polyethylene Coatings, Polymer Coatings, Electrode, Iron, Bronze, Copper, Dissolution, Dissolving, Cathodic Protection, Altered Coatings, Unalloyed Aluminum Field testing

AD A073 222 12/2 0/20 12/1 0/8

20/4

TULANE UNIV NEW ORLEANS LA DEPT OF CIVIL ENGINEERING

(U) Review of Toxic Spill Modeling

DESCRIPTIVE NOTE Final rept 1 Feb-1 Dec 77

NOV 78 208P

PERSONAL AUTHORS Benedict, Barry A

CONTRACT NO 108835 77-C-0237

PROJECT NO 1800

TASK NO 5W

MONITOR CIEDM TR-76 50

UNCLASSIFIED REPORT

ABSTRACT (U) This study is a literature survey which identifies existing mathematical models available for the description of toxic spills into waterways. Advantages and disadvantages of numerous models are discussed. Emphasis is placed on model coefficients. These are very difficult to obtain. Guidelines are presented for coefficient selection. This selection must consider such parameters as river banks, varying channel geometries, stratified flows and oscillating flows (the interactions of convective transport, turbulent mixing, chemical reactions and other processes are reviewed). Guidelines are also given for matching the best mathematical model to particular toxic spill scenarios. Modeling technique is discussed to fully describe toxic spills. This literature review provides a useful planning tool for future model development. (Author)

DESCRIPTORS (U) Water pollution, Mathematical models, Toxic agents, Spilling, Water quality, Waterways, Rivers, Lakes, Estuaries, Channels, Waterways, Diffusion, Dispersion, Coefficients, Fluid flow, Transport properties, Mixing, Chemical reactions, Literature surveys, Damage assessment

IDENTIFIERS (U) Toxic spills, PE82801F WUCED019005428

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AD A073 431

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A070 941

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AD-A070 940

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SYSTEMS ENGINEERING AND SOFTWARE LA JOLLA CALIF

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
(YNDAL) AFB FI DETACHMENT 1 (ADIC)

(U) LEAK DETECTION STUDY

DESCRIPTIVE NOTE Final rept Dec 77-Feb 79

(U) A Literature Search and Review of the Dynamics of  
Aircraft Surface Interaction

JUL 79

78P

DESCRIPTIVE NOTE Final rept 1 Oct 77-31 May 78.

PERSONAL AUTHOR: LEVINS, P I, BROCA, R D

JUN 79

81P

REPORT NO 355-R 70 3643

PERSONAL AUTHOR: Cox, Joseph J JR, Henghold, William H  
(Russell John J)

CONTRACT NO F04725-78-C 0025

REPORT NO GEED-1R-78-30

PROJECT NO 2054

PROJECT NO 2104

TASK NO 50

TASK NO 2B

ABSTRACT  
TITLE: GASEOUS  
TR-78-05

UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) The purpose of this study was to investigate the feasibility of using tracer gas technology to locate leaks in underground RIC-WIL steam pipe casings. A series of controlled model experiments at the contractor's plant demonstrated that one or more leaks in a buried steel pipe could be detected by surface measurement of tracer gas concentration. A full-scale demonstration test was conducted at Naval Air Station North Island on a 400 foot casing with suspected leaks. Two leaks were localized to within three feet using the hardware and procedure developed during the controlled experiments. Replication would be required before this technology could be used on a routine service basis at Air Force Bases. (Author)

DESCRIPTORS (U) Leak detectors, Tracer studies, Steam pipes, Trace gases, Gas chromatography, Diffusion, Sulfur compounds, Fluorides, Halogenated hydrocarbons

IDENTIFIERS (U) PC#4708F MUCEED020545012

AD-A070 941

AD-A070 940

UNCLASSIFIED

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ABSTRACT (U) This report presents a literature survey and reviews the research concerned with the dynamics of aircraft surface interaction. The primary concern is the determination of surface roughness effects on flow through the surface can be without including a model in how roughness in the aircraft. Attention is concentrated on analytical research in the form of computer simulation that deal with the aircraft response as a function of the input (external excitation), vehicle model, and the output (basic conclusions include the fact that no current computer code is satisfactory but that one could be formulated within the state-of-the-art to correlate with on-going actual aircraft tests. To facilitate correlation the roll, yaw, and lateral degrees of freedom should be included and a fatigue analysis for the test aircraft should be made. (Author)

DESCRIPTORS (U) Runways, Surface roughness, Aircraft, Wind tunnels, Computerized simulation, Fatigue, Mechanics, Design factors, Engineering, Trade off analysis, Roll yaw, Degrees of freedom, State of the art, Literature surveys



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DTIC MEMPHIS BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD A070 480

CONTINUED

Continued flight training, flight testing, hazards air  
base facilities range facilities, land use  
classification, compatibility displays  
containing information from training

INTERESTS (U) SACURAMP compatibility Use Zones  
FIRING WRESTLING SUBS

AD A070 480

1.2

MISSOURI UNIV COLUMBIA DEPT OF CIVIL ENGINEERING  
(U) Metal hydroxides from electrophoretic sludge  
Characterization and Metal Recovery

DEVELOPMENT DATE Final Sept 20 Jul 77-18 Feb 78

AD A070 480

PERSONAL AUTHORS Novak John F , Ghosh, Ariganka M ,  
Knecht William , Leveniger Thomas , Feb, Charles

CONTRACT NO FOR 77 C 0281

PROJECT NO 2054

TASK NO 1M

MONITOR AFSC/ESI  
ON 18 MB

UNCLASSIFIED REPORT

ABSTRACT (U) The purpose of this project was to investigate the precipitation of metals from plating facilities to determine the dewatering characteristics of the resultant metal hydroxide slurries and to evaluate the solvent extraction process for metal recovery and reuse. Individual metals were found to precipitate according to the theoretical solubility calculations, however, mixed metals solutions containing Cr (III) often result in certain metals precipitating at pH levels below the range of predicted insolubility. Colloidal metal hydroxides remaining after settling could be removed by filtration using either a glass filter or diatomaceous precoat pressure filter. Metal removal was effective (80%) when the filtrate metal concentrations were not sufficiently low to meet effluent requirements. Sludges produced by hydroxide precipitation varied depending upon the pH of precipitation and the specific metals in the sludge. Sludge dewatering characteristics were found to be determined by the mean particle size of the flocs. Polymers improved dewatering rates by increasing the mean floc size. Freshly precipitated chromium hydroxide sludges were found to pass through filtering media because of floc break up. Polymer conditioning was necessary to prevent sludge penetration through the

AD A070 480

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OTIC REPORT YILUIGIAPHY SEARCH CONTROL NO 025028

AD A070 223 CONTINUED

AD A068 836 8/17 11/4

silicon media. Solvent extraction could be used to selectively extract individual wastes from mixed metal sludge but the process was not economical (Author)

DESCRIPTIONS (U) reelectroplating, waste water, sludges, precipitation, sludges, slurries, extraction, pH factor, waste treatment, water pollution

REFERENCES (U) PUBINTUF, NUCLEOD0414N3002

NAVY CLOTHING AND TEXTILE RESEARCH FACILITY NA/100 MA  
(U) Aluminized fireman's (fire proximity) Handwear  
Redesign of Experimental Prototype

DISCRIPTIVE NOTE Final rept Oct 78-Sep 77.

DEC 78 11P

PERSONAL AUTHORS Andrus, Francis S.

REPORT NO NCIRF 136

PROJECT NO 414N

TASK NO 30

IGNITOR CEEDO

TR-78-06

## UNCLASSIFIED REPORT

ABSTRACT: (U) The Navy Clothing and Textile Research Facility (NCIRF) continued development work to improve a new experimental configuration of aluminized fire proximity handwear having increased tactility and manipulatory capabilities. An improved prototype was completed and additional quantities of this model are being manufactured for further testing and establishment of thermal protection parameters. Performance of tests is recommended with a view towards completing the program and possible adoption of this new configuration as a replacement for current standard fire proximity handwear.

DESCRIPTORS (U) gloves, protective clothing, fire resistant materials, thermal insulation, firefighting, human factors engineering, aluminum, abestos, polyamide plastics, composite materials

IDENTIFIERS (U) LPN-AFCEC-77 002, NUCLEOD0414N3008  
FL04714F

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AD A068 836

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## OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 053019

AD-A089 488

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AD-A089 448

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CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TFTALL AFB FL DETACHMENT 1 (ADFC)NEW MEXICO UNIV ALBUQUERQUE ERIC H WARD CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Hydrazine Disposal by Burning

(U) An Evaluation of Asphalt-Pneum Mixtures for Use in  
Pavement Systems

DESCRIPTIVE NOTE Interim rept Sep 78-Oct 78.

DESCRIPTIVE NOTE final rept Apr 77-Feb 79.

ACC 78

11P

APR 79

83P

PERSONAL AUTHORS Scauffer, Thomas A ; Farnon, Melvin D .

PERSONAL AUTHORS Decker, Dale S , Grit/in Donald f  
Nielson John P .

REPORT NO CELDO-TR-78-55

CONTRACT NO 1-29601-78-C-0015

PROJECT NO 1900

PROJECT NO 2104

TASK NO 4C

TASK NO 1A

UNCLASSIFIED REPORT

MONITOR

CEEDO

TR-78-02

ABSTRACT (U) Burning was evaluated as a technique for the disposal of hydrazine and amine hydrazine solutions. Samples were collected above the burning pool and analyzed for hydrazine concentration to determine if concentrations exceeded the personnel exposure threshold limit value of 0.13 mg/m<sup>3</sup>. Results indicate that neat fuel burns rapidly leaving little residual hydrazine, but ignition of aqueous solutions becomes progressively more difficult as the water concentration increases. Some air samples collected above the burning hydrazine solutions exceed NIOSH personnel exposure limits. However, high destruction efficiency, rapid destruction, and potential cost savings make burning an attractive alternative to chemical neutralization under controlled conditions as discussed in this report. (Author)

DESCRIPTORS (U) hydrazine disposal ; incinerators ; toxicity ; liquid rocket propellants ; solutions (mixtures) ; water ; environmental impact statements ; combustion ; air pollution ; safety ; low costs

IDENTIFIERS (U) Incineration, WUCFEDU 9004C01, VL82 01F

AD A089 488

AD A089 418

UNCLASSIFIED

PAGE 5 0554-28

UNCLASSIFIED REPORT

ABSTRACT (U) The design and construction of airfield pavements have not been developed sufficiently to provide pavements that will not crack. Cracking is a response to traffic and environmental conditions or to the construction material. For many years, rubber in several different forms has been added to asphalt with limited success in reducing pavement cracking. The report reviews the efforts to control cracking by incorporating rubber (or asphalt) into seal coats, crack fillers, and joint sealers. Two extensive literature reviews indicate that conflicting conditions have been reached regarding various applications of the asphalt-rubber material. (a) The asphalt-rubber products available from high percentages of rubber (20 to 30 percent by weight) appear to be the most promising for airfield pavements, although the effectiveness of asphalt-rubber in controlling or reducing pavement cracking has not been conclusively demonstrated. No superiority of one asphalt-rubber product was indicated in the literature for use on the danger of loose aggregates. (b) The use of the asphalt-rubber seal aggregates should not be used on facilities where loose edges could be a problem. (c) Improving the membrane interlayer is recommended.

UNCLASSIFIED

DIC REPORT BTL-DIGRAPH SEARCH CONTROL NO. 15562

U. S. 1/2 1/2

AD-5039 448 CONTINUED

application of asphalt-mastic that should be considered for military runways at this time

DESCRIPTORS (U) Pavements, Asphalt, Rubber  
Construction materials, Landing fields, Runways,  
Literature surveys, Layers, Mortars, Gravel, Repair  
Safety, Military facilities, Composite materials,  
Concrete, Mixtures

IDENTIFIERS (U) WACEED021041A24 PE03723F

1. ENGINEERING 1/2 1/2 1/2  
Solid Waste Source Separation  
Force Base, California  
Solid Waste Management System

DESCRIPTIVE NOTE Final report Jan 75 Aug 78

DEC 78 43P

PERSONAL AUTHOR: Ward, Carter L. Spruier John

REPORT NO. CEI N-04-7R 07

MONITOR CEEDO  
TR-76 49

UNCLASSIFIED REPORT

ABSTRACT (U) This report summarizes the impact on solid waste management operations caused by the implementation and operation of a solid waste source separation program at Vandenberg Air Force Base, California. Results of the program will be incorporated in a waste management recovery program, also under development by the Civil and Environmental Engineering Development Office (CEEDO) (Action)

DESCRIPTORS (U) Solid wastes, Waste management,  
Waste recycling, Air Force facilities, Air Force  
Collection, Cost analysis, Surveys, Photography,  
Environmental protection, Savings, Data acquisition

IDENTIFIERS (U) LPI CEEDO 77 20, LPH-CEEDO 78-1-1

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DYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO OFC02P

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AD-A069 473 13/2 21/9 1

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TINDALL AIR FL DETACHMENT 1 (ADTC)AIR FORCE ENGINEERING AND SERVICES CENTER TYPICAL AFB FL  
ENGINEERING AND SERVICES LAB

(U) JP-4 Fuel Storage Emissions

(U) The Autoxidation of Monomethylhydrazine Vapor

DESCRIPTIVE NOTE Final rept Sep 77-Dec 78.

DESCRIPTIVE NOTE Final rept Jan 74-Jan 78.

DEC 78 32P

APR 79 EOP

PERSONAL AUTHORS Stauffer, Thomas B.

PERSONAL AUTHORS Stone, Daniel A.

REPORT NO CEEDO-TR-73-05

REPORT NO AFES-TR-79-10

PROJECT NO 2103

PROJECT NO 1900

TASK NO 2C

TASK NO 20

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) JP-4 vapors from underground fixed roof storage tanks were analyzed for hydrocarbon concentration by Gas Chromatography using a Flame Ionization Detector. Results are compared with predictions based on American Petroleum Institute correlations. Since Air Force tanks are normally refilled within 24 hours of emptying, only turnover times of 24 hours and less were considered. It was found that within 24 hours of emptying, air replaced only 7% of JP-4, saturated vapor. At turnover times of 7 to 15 hours and less, the expelled air actually could be measured as being less than predicted by equations because of the rapid turnover and consequent reduction in vapor concentration. Data presented provide a basis for calculating a rough estimate for hydrocarbon mass emitted based on fuel storage temperature. Actual mass emissions measured during the study varied from 0.8 to 1.5 lb/1000 gal of JP-4, transferred while the fuel temperature ranged from 51 F to 78 F (Author)

DESCRIPTORS (U) \*Jet engine fuels. \*Storage tanks. \*Underground facilities. Vapors. Hydrocarbons. Flames. Concentration (Chemistry). Gas chromatography. Instrumental analysis. Fuel storage. Fuel tanks. Air pollution. Environmental effects. Mathematical prediction. Data acquisition.

IDENTIFIERS (U) JP-4 fuel WUCEE0021032C10 PB63723F

AD-A069 280

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## UNCLASSIFIED

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ABSTRACT (U) Results of experiments simulating atmospheric autoxidation of monomethylhydrazine vapor are presented. Wet partial pressures ranged from 2 to 7 mm Hg at room temperature and all experiments were run at room temperature. Results show that the major products of MMH autoxidation in air are formaldehyde, monomethylhydrazine, methanol, methanol, nitrogen and water. The reaction rate appears to be heterogeneous, controlled by the rate of activity and surface to volume ratio being important factors. Wet bulb life ranged from two to seven hours (Author)

DESCRIPTORS (U) \*Methyl hydrazine. \*Oxidation. \*Air pollution. Simulation. Pollutants. Hydrazones. Formaldehyde. Nitrogen. Methanol. Carbinols. Water. Room temperature.

IDENTIFIERS (U) Autoxidation, WUJFESC15002015 PB62801F



UNCLASSIFIED

AD-A069 045 13/11 11/6 15/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO Q59028  
 HARCO CORP MEDIA OH  
 (U) Techniques for Cathodic Protection Testing over Airfield Pavements  
 DESCRIPTIVE NOTE: Final report of 77-Jul 78 on Phase 1.  
 IPR 79 71P  
 PERSONAL AUTHORS: Busock, Bernard  
 CONTRACT NO: 108438-77-C-024  
 PROJECT NO: 2104  
 TASK NO: 5C  
 MONITOR: CEEDO  
 78-78-31

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes the techniques developed for cathodic protection testing over airfield pavements. Test results conclusively proved that the accuracy of all pipe-to-surface potential measurements taken over pavement surfaces are questionable. On concrete pavement it was found that potential readings differed from readings on adjacent soil by more than 100 millivolts. Potential readings over well sealed asphalt surfaces were even higher when using high input impedance electronic voltmeters. Potential readings over deteriorated asphalt were possible but the accuracy was poor. Accurate potential measurements over pavement surfaces can be made only if the reference electrode contacts the surface beneath the pavement. This report recommends a procedure for easily penetrating the pavement surface and installing a pavement insert through which a modified reference electrode may be inserted. (Author)

DESCRIPTORS (U) Pipelines, Cathodic protection, Test methods, Corrosion inhibition, Corrosion, Runways, Pavements, Landing fields, Solids, Voltage, Measurement, Electrodes, Underground, Copper compounds, Sulfates

IDENTIFIERS (U) PE877237, WUCEL021045C01

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AD A069 991

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AD-A068 991 20/4 13/4 13/2  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB  
 (U) Control of JP-4 Emissions from Underground Storage Tanks  
 DESCRIPTIVE NOTE: Interim report Jun-Sep 78.  
 APR 79 31P  
 PERSONAL AUTHORS: Lewandowski, Gordon A; Stauffer, Thomas B  
 REPORT NO: AFFSC/ESL-TR-78-03  
 UNCLASSIFIED REPORT

ABSTRACT: (U) The South Coast Air Quality Management District, in southern California, is presently requiring control of JP-4 emissions from storage tanks at March, Norron, and George AFB. It is expected that such controls may eventually be required at other Air Force stations. Therefore, an engineering study was undertaken to (1) review the problem for Southern California and make recommendations where appropriate, and (2) determine the extent of the problem for the USAF as a whole. This report covers the first of these objectives. After visiting the above mentioned Air Force bases, and completing an engineering assessment of potential control strategies, low temperature refrigeration and recovery of condensed JP-4 vapors is recommended as the best control method. (Author)

DESCRIPTORS (U) Jet engine fuels, Storage tanks, Underground facilities, Air pollution, Pollution abatement, Emission, Refrigeration, Environmental protection, Air Force facilities, Laboratories, Recovery, Refrigeration systems, Incinerators, Absorption

IDENTIFIERS (U) JP-4 fuel, PE82801F, WUCEL9007002

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A008 617 10/4 13/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB(U) Interim Field Procedure for Bomb Damage Repair (Using  
Crushed Limestone for Crater Repairs and Sillikal  
(Trade Name) for Spall Repairs).

DESCRIPTIVE NOTE: Interim rept Jun 78-Mar 79.

APR 79 51P

PERSONAL AUTHORS. McMerney, Michael T. .

REPORT NO. AFSC/ESI-TR-79-01

PROJECT NO. 2104

TASK NO. 28

UNCLASSIFIED REPORT

594

ABSTRACT: (U) This report describes a recommended procedure for performing repairs on large and small bomb craters using crushed stone and spall repair material. The report also describes a method of spall repair technique using a proprietary polymer concrete product. The repair techniques are described to determine the equipment, manpower, and time required to effect repairs. The report gives a brief description of the results of field tests using the crushed stone and polymer concrete techniques (Author)

DESCRIPTORS: (U) Bomb damage, Pavements, Runways, Repair, Maintenance, Field conditions, Civil engineering, Craters, Explosion effects, Limestone, Spallation

IDENTIFIERS: (U) Runway Repairs, Polymer-Concrete, Sillikal, WAFESC21042822, P683723F

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## SEARCH CONTROL NO 055028

AD-A008 264 8/17 6/7

NAVY CLOTHING AND TEXTILE RESEARCH FACILITY NATICK MASS

(U) Insulated Firefighters' Crash-Crew Rescue Boots and Components Field and Laboratory Evaluation

DESCRIPTIVE NOTE: Final rept Oct 70-Sep 77.

DEC 78 44P

PERSONAL AUTHORS. Bailey, Milton ;

REPORT NO NCTR-137

PROJECT NO. 414N

TASK NO 30

MONITOR CEENO  
TR-78-07

UNCLASSIFIED REPORT

ABSTRACT: (U) The Navy Clothing and Textile Research Facility (NCTR) conducted an evaluation of commercial insulated firefighters' boots worn by crash firefighters at Naval Air Station, John and three Air Force Bases. The evaluation showed that the standard footwear was significantly superior to the standard firefighters' boots currently in the supply system. Reflective spats, accessories sometimes used to cover boots for additional protection against high heat, were considered unnecessary by the subjects who thought the insulation of the test boots provided sufficient protection. Laboratory findings, however, showed that spats would indeed be needed if personnel became immobilized and were subjected to 1.89 gal/sq cm/sec heat for 30 seconds or longer. The laboratory tests also showed that the heat rapidly penetrates and destroys soiled aluminized fabrics. Based on these findings, NCTR recommends: (1) insulated firefighters' boots replace standard firefighters' boots; (2) commercial aluminized spats be stocked as supporting gear; and (3) reflectivity be maintained on aluminized gear and maintained daily, particularly on polished and painted areas, to assure peak personnel protection at all times (Author)

DESCRIPTORS (U) Boots, Rescue equipment, Fire fighting, Crews, Heat transfer, Naval equipment, Crashes

AD-A008 264

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A066 284 CONTINUED

AD-A067 282 13/2 21/2 1/3

IDENTIFIERS. (U) LPN-AFCEC-PO-77-C2, WUCCED0414N3006,  
PEG4714FCIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)(U) Aircraft Air Pollution Emission Estimation Techniques -  
ACCE

DESCRIPTIVE NOTE: Final rept. Aug 77-Aug 78.

SEP 78 107P

PERSONAL AUTHORS Scott, Harold A., Jr., Naugle, Dennis F.

REPORT NO CEEDQ-TR 78-33

PROJECT NO 2103

TASK NO 5A

UNCLASSIFIED REPORT

595

Availability document partially illegible

ABSTRACT. (U) A five-step analytical methodology is presented that can be adapted to nearly any aircraft related air quality assessment problem. The methodology is for use by base level environmental personnel to calculate: (1) annual aircraft emissions, and (2) downfield pollutant concentrations. The latest individual engine emission factors and other information required for the methodology are contained in this report (Author)

DESCRIPTORS (U) \*Air pollution, \*Aircraft exhaust, \*Exhaust gases, \*Aircraft, Air quality, Smoke, Jet engine exhaust, Contaminants, Environmental protection, Measurement, Test methods, Hydrocarbons, Carbon monoxide, Emission

IDENTIFIERS (U) \*Aircraft Air Pollution,  
WUCCED041035A28, PE03723F

AD-A066 284

AD-A067 282

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DTIC REPORT BIBLIOGRAPHY

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AD-A068 834

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CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) Removal of Trichloroethylene Contamination from  
Drinking Water at a USAF Installation

(U) Laboratory Evaluation of Expedient Pavement Repair  
Materials

DESCRIPTIVE NOTE: Interim rept. 1 Aug 77-31 Jul 78.

DESCRIPTIVE NOTE: Final rept. Jan 78-Jun 78.

JUL 78 18P

JUN 78 83P

PERSONAL AUTHORS: Perry, Robert G ;

PERSONAL AUTHORS: Rollings, Raymond S. ;

REPORT NO CEF00-TR-78-48

REPORT NO CEED0-TR-78-44

UNCLASSIFIED REPORT

PROJECT NO. 2104

596

ABSTRACT: (U) Trichloroethylene (TCE), a solvent previously used by numerous USAF industrial activities as a degreasing agent, was discovered in unusually high concentrations in the drinking water distribution system at one USAF installation. Various USAF agencies, the U S. Environmental Protection Agency cooperated in research work to determine the most economically feasible method to remove TCE from the water supply. This report documents the historical aspects of the problem and the results of this phase of the research (Author)

DESCRIPTORS: (U) Water treatment, Drinking water, Air force facilities, Trichloroethylene, Contaminants, Water pollution, Health, Environmental protection, Removal, Water supplies, Purification

TASK NO. 28

UNCLASSIFIED REPORT

ABSTRACT: (U) Past work and current techniques; literature were reviewed to determine potential capping materials for expedient repair of small craters (less than 20 by 20 feet) in areas of airfield pavements. Seven materials identified in the literature review were tested in the laboratory to develop information on their strength and cure requirements. Accelerated high modulus cement, magnesium phosphate cement, three types of asphalt products and unsurfaced, well compacted aggregate were recommended for field testing as the most promising small crater repair materials. (Author)

DESCRIPTORS: (U) Landing fields, Civil engineering, Pavements, Repair, Literature surveys, Bombing, Damage assessment, Cratering, Concrete, Asphalt, Laboratory tests, Curing, Reinforced concrete, Aluminum, Magnesium compounds, Phosphates

IDENTIFIERS: (U) WUCYFD021042B22, PE63723F

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AD-A068 834

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## DTIC REPORT BIBLIOGRAPHY

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NAVY CLOTHING AND TEXTILE RESEARCH FACILITY WATICK MASS

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADIC)(U) Field Evaluation of Experimental Crash-Crew  
Firefighter's Facepiece(U) Evaluation of Materials for Post-Attack Pavement  
Repair

DESCRIPTIVE NOTE Final rept Oct 78-Sep 77.

DESCRIPTIVE NOTE Final rept Sep 78-Dec 77.

DEC 78 47P

PERSONAL AUTHORS: Audet, Norman F ;

SEP 78 108P

REPORT NO NCTRF-123

PERSONAL AUTHORS Rome, C L , Sullivan, A L . III.

PROJECT NO. 414N

REPORT NO CEED0-TR-78-18

TASK NO 30

PROJECT NO 2104

MONITOR: CEED0

TASK NO 28

TR-78-05

UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) The Navy Clothing and Textile Research Facility (NCTRF), under the sponsorship of the Civil and Environmental Engineering Development Office (CEEDO), Detachment 1 ADIC, Tyndall Air Force Base, conducted a field evaluation of an Abcote facepiece, constructed a crash-crew firefighter's gold 'acetylene' helmet, and the experimental facepiece was worn durable to determine if standard item. Laboratory results had previously shown the experimental facepiece to have at least 10 times better abrasion resistance than the standard (Author)

DESCRIPTORS: (U) \*faceplates, \*ground crews, \*fire fighting, \*fire protective clothing, \*naval personnel, \*crashes, \*rescue equipment, \*abrasion, \*fire resistant coatings, \*gold, \*laboratory tests, \*field tests, \*infrared radiation, \*heat resistant materials, \*heat transmission

IDENTIFIERS: (U) LPN-AFCEC-PO-77-02, WUCIED0414N3008, PE04714F

ABSTRACT: (U) This study was conducted to evaluate the performance of candidate materials used to repair small damaged areas in pavement when subjected to traffic by an F4C aircraft loading. The study consisted of preparing simulated damaged areas in portland cement concrete pavement and flexible pavement and repairing the areas with selected materials. The evaluation was based on the performance of the repaired areas when subjected to accelerated traffic with a loading equivalent to one main gear of the F4C aircraft (Author)

DESCRIPTORS: (U) \*landing fields, \*pavements, \*repair, \*maintenance, \*fighter aircraft, \*damage assessment, \*cements, \*reinforced concrete, \*asphalt, \*loads (forces), \*epoxy resins, \*asphalt, \*polyester fibers, \*limestone, \*postattack operations

IDENTIFIERS: (U) F-4C aircraft, LPN CEED0-77-81, WUCIED021042823, PE03723F

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A068 492 6/17

AD-A068 492 CONTINUED

NAVY CLOTHING AND TEXTILE RESEARCH FACILITY MATIX MASS

IDENTIFIERS (U) PB84714F, WUCEE0014N3008

(U) Aluminized Firefighters' Crash-Rescue Protective Hood  
Facepiece-Visor Redesign Study

IAC NO. PL-092338

DESCRIPTIVE NOTE: Final rept Oct 76-Sep 77.

IAC DOCUMENT TYPE: PLASTIC - HARD COPY --

IAC SUBJECT TERMS P--(U)Design optimization, Protective  
clothing, Textiles, Facepieces, Flame retardants,  
Aluminized, Military applications, Prototypes, Visors, Test  
methods, ZZ Unlimited.

PERSONAL AUTHORS: Andruk, Francis S.

REPORT NO. NCTRF-134

CONTRACT NO. AFCEC-77-002

PROJECT NO. 414N

TASK NO. 30

MONITOR: GEEDO  
TR-78-04

598

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) The Navy Clothing and Textile Research Facility (NCTRF) conducted a redesign study for the purpose of improving the standard aluminized firefighters' crash-rescue hood. Efforts were directed towards developing an adjustable facepiece visor assembly, which would permit unrestricted visibility, venting communication, and the exchange of fresh air during standby situations. An adjustable configurable commercial type was fabricated and subjected to a limited performance test. Results showed this type to be highly functional; however, under fire emergency conditions, several areas proved to be marginal or inadequate. To alleviate these problem areas, NCTRF modified the facepiece design. As the required task approached a conclusion, the fiscal year ended and the program terminated, because the need still exists for an improved hood, appropriation of additional funds and continuance of this redesign study is recommended.

**DESCRIPTORS.** (U) Fire protective clothing, Hoods, Visors, Protective coverings, Fire resistant materials, Aluminum, Test methods, Performance tests, Naval research, Crashes

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A085 829 13/2 7/3

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) The Ozone Oxidation of Hydrazine Fuels

DESCRIPTIVE NOTE Final rept Jun-Sep 78.

SEP 78 117P

PERSONAL AUTHORS Sterka, Raymond A.; Cowen, William F.

REPORT NO CEEDO-TR-78-43

PROJECT NO. 2103

TASK NO 7W

UNCLASSIFIED REPORT

ABSTRACT: (U) This research centered on the treatment of aqueous solutions of hydrazine (H), monomethylhydrazine (MMH), and unsymmetrical dimethylhydrazine (UDMH) by ozone. A parametric study was conducted to evaluate the effect of solution concentration and pH, the two catalysts ultraviolet (UV) light and ultrasonics, reactor inlet ozone gas phase concentration and superficial gas velocity. The objectives of this research were (1) to establish the stoichiometry and kinetics of the ozone oxidation of H, MMH, and UDMH in aqueous solution; (2) to identify the partial oxidation products from the ozone oxidation of hydrazine fuels; (3) to accomplish toxicity testing of the ozone-treated wastewaters with fathead minnows and Daphnia magna.

DESCRIPTORS: (U) \*Waste water, \*waste treatment, \*hydrazine, \*ozone, \*solutions (mixtures), Water soluble materials, Hydrazine derivatives, Concentration (Chemistry), pH factor, Catalysts, Ultraviolet radiation, Ultrasonic radiation, Gases, Stoichiometry, Oxidation reduction reactions, Fishes, Bioassay

IDENTIFIERS: (U) PC83723F, WUCEED021037W80

AD-A085 828

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AD A085 875

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MARYLAND UNIV COLLEGE PARK COMPUTER SCIENCE CENTER

(U) Some Properties of Bottom-Up Cellular Pyramids

DESCRIPTIVE NOTE: Technical rept.

FEB 78 18P

PERSONAL AUTHORS, Dyer, Charles R.; Nakamura, Akira.

REPORT NO TR-731

CONTRACT NO AFOSR-77-3271A

MONITOR AFOSR  
TR-79-0208

UNCLASSIFIED REPORT

ABSTRACT: (U) The formal language recognition capabilities of bottom-up pyramid cellular acceptors are examined. The main result establishes that deterministic bottom-up pyramid acceptors are weaker than deterministic bounded cellular array acceptors, in both one and two dimensions. (Author)

DESCRIPTORS: (U) \*Automata, \*Pattern recognition, Image processing, Mapping (Transformations)

IDENTIFIERS: (U) Cellular automata

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

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AD-A083 789 21/2 21/5

NEW MEXICO UNIV ALBUQUERQUE ERIC H NAWO CIVIL  
ENGINEERING RESEARCH FACILITY

SCOTT ENVIRONMENTAL TECHNOLOGY INC PLUMSTEADVILLE PA

(U) Transportable Wastewater Advanced Refinement and  
Demonstration System.

(U) F-100 Turbine Engine Afterburner Emission Tests

DESCRIPTIVE NOTE. Final rept Nov 78-Dec 77.

DESCRIPTIVE NOTE. Final technical rept 11 Nov 77-15 May  
78.

SEP 78 90P

PERSONAL AUTHORS: Souza, Anthony F, Scott, Harold A, Jr.

OCT 78 217P

REPORT NO SET-1028-01-1177

PERSONAL AUTHORS: Williams, Neil D; Matthews, James; Perry,  
Robert G, ;

CONTRACT NO F0835-77-C-0218

CONTRACT NO. F22601-78-C-0015

PROJECT NO 2103

PROJECT NO. 2103

TASK NO 2A

TASK NO. 7M

MONITOR: CEEDO

TR-78-54

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report documents the design of the  
Transportable Wastewater Advanced Refinement and  
Demonstration System (TARDS). The unit features advanced  
conceptual wastewater treatment such as induced laminar  
biological position sludge collection, fluidized bed and  
biologic denitrification, and automated instrumentation. A  
recommended development plan is included with the report  
which outlines the fabrication schedule and cost  
estimates for all phases of the project. (Author)

ABSTRACT: (U) The afterburner exhaust emissions from  
three F-100-P-100 engines were measured. Emission rates  
of hydrocarbons, carbon monoxide, and oxides of nitrogen  
were calculated. Smoke numbers were also measured  
(Author)

DESCRIPTORS: (U) \*Exhaust gases, \*Afterburners, \*Gas  
turbines, Air pollution, Particulates, Carbon monoxide,  
Nitrogen oxides, Measuring instruments, Data acquisition,  
Test methods, Sampling, Jet fighters

IDENTIFIERS: (U) F-15 Aircraft, F-18 Aircraft, PE83723F,  
MUCEED021032A48

DESCRIPTORS: (U) \*Transportable, \*Waste water, Water  
treatment, Data processing, Cost analysis

IDENTIFIERS: (U) PE83723F, MUCEED021037U85

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

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AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) Premature Failure of Deep Well Anodes

DESCRIPTIVE NOTE Final rept Dec 75-May 78.

(U) Civil and Environmental Engineering Development Office  
Fiscal Year 1980 Technical Objectives Document

JUN 78 48P

DEC 78 21P

PERSONAL AUTHORS Lewicki, Thomas F .

REPORT NO CEEDO-TR-78-57

PROJECT NO 2102

UNCLASSIFIED REPORT

TASK NO. 40

MONITOR: CEEDO  
TR-78-40

## UNCLASSIFIED REPORT

ABSTRACT. (U) This report covers an investigation into the causes of premature failure of deep well anodes. Anodes or lead wires were retrieved from two failed deep well anode beds and analyzed. Deep well conditions were simulated in the laboratory and graphite and HSCI anodes were subjected to different electrolytes and normal current outputs. A new wire insulation was tested and compared to 108P insulation under deep well conditions in the lab. (Author)

ABSTRACT. (U) This TOD describes the three Technical Planning Objectives developed to guide the conduct of research and development in passive defense techniques for the theater airbase, pavement studies, environmental pollution abatement and control, air mobility concepts, fire fighting equipment and resource/energy conservation (Author)

DESCRIPTORS: (U) \*Environmental engineering, \*Air Force facilities, Air force planning, Air force research, Landfill fields, Pavements, Corrosion, Airmobile operations, Pollution abatement, Fire fighting, Fire protection, Energy conservation, Civil engineering, Military requirements, Technology forecasting, Defense planning

IDENTIFIERS (U) Technical objectives documents.  
PE62801F, PE63723F, PE94708F

DESCRIPTORS. (U) \*Corrosion inhibition, \*Water wells, \*Anodes, Galvanic corrosion, Electric wire, Graphite, Lead wires, Simulation, Failure, Hydrostatic pressure, Electrolytes, Gas generating systems, Gas analysis

IDENTIFIERS. (U) Deep wells, Well anodes, PE63723F, WUCED021024005

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A002 605 21/2 13/2

LUNDGREN (DALE A) GAINESVILLE FL

(U) Low Efficiency Control Measures for Jet Engine Test Cells

DESCRIPTIVE NOTE Final rept Apr-Sep 78.

SEP 78 28P

PERSONAL AUTHORS: Lundgren, Dale A ;

CONTRACT NO F08037-78-M-1387

PROJECT NO. 2103

TASK NO. 70

MONITOR: CEEDO  
TR-78-53

UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes the findings of low cost, relatively low efficiency emission control measures for reduction of jet engine test cell opacity to less than 20%. The recommended cost effective opacity reduction system consists of an effective water spray system; a glass fiber mist eliminator, a medium efficiency, high velocity, throw-away type glass fiber filter, and a reduced test cell discharge area. The report discusses the following topics: control methods, opacity, scrubbers, demisters, and filters (Author)

DESCRIPTORS: (U) Jet engine exhaust, Air pollution control equipment, Test equipment, Opacity, Cost effectiveness, Water, Sprays, Glass fibers, Water filters, Scrubbers, Gas turbines, Smoke, Particulates

IDENTIFIERS (U) PB03723F, WUCED021037001

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CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDAL AFB FL DETACHMENT 1 (ADTC)

(U) Analysis of Air Force Solid Waste Management Practices

DESCRIPTIVE NOTE Final rept May 75-Feb 78.

MAY 78 172P

PERSONAL AUTHORS: Offenbittel, Robert F. .

REPORT NO CEEDO-TR-78-20

PROJECT NO. 2103

TASK NO. 6W

UNCLASSIFIED REPORT

ABSTRACT (U) This report discusses solid waste management practices within the Air Force. The discussion is organized according to a specific area of the waste management function (namely): type of mission function/activity; operation characteristics; collection practices; processing activities; disposal practices; costs, and recycling. The report includes a comparison of waste management practices on a selected command-by-command basis, and with national data, whenever available (Author)

DESCRIPTORS (U) Solid wastes, Waste management, Refuse collection, Air Force facilities, Waste disposal, Recycled materials, Cost analysis, Value engineering, Resource management, Conservation, Civil engineering.

IDENTIFIERS (U) WUCED021036W73, PB03723F

## UNCLASSIFIED

DYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A082 184 21/2 13/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADIC)(U) Particle Collection by Water Injection in Test Cells  
DESCRIPTIVE NOTE Interim rept. 1 Sep 78-1 Oct 78.

ADV 70 8P

PERSONAL AUTHORS: Daley, Peter S. Lundgren, Dale A.

REPORT NO CEED0-TP-78-51

PROJECT NO 2103

TASK NO 70

UNCLASSIFIED REPORT

ABSTRACT. (U) This report summarizes the mechanisms by which particles may be removed when water is injected into turbine engine test cell exhaust streams. The report concludes that impaction between soot particles and droplets is the most important mechanism and that there is an optimum flow rate at which water should be injected to assure maximum removal efficiency. (Author)

DESCRIPTORS. (U) \*particulates, \*exhaust gases, \*collecting methods, \*turbines, \*water injection, \*air pollution, \*soot, \*test equipment, \*removal

IDENTIFIERS. (U) WUCEED021037001, PE83723F

AD-A082 136 8/7 1/5

NAVAL WEAPONS CENTER CHINA LAKE CALIF

(U) Geothermal Potential at US Air Force Bases

DESCRIPTIVE NOTE Final technical rept Jan 77-Sep 78.

ADV 78 81P

PERSONAL AUTHORS Austin, Carl F.; Whisman, J. A.

REPORT NO NWC-TP-8378

CONTRACT NO PRD-77-0021

MONITOR: CEEDO  
TR-78-47

UNCLASSIFIED REPORT

ABSTRACT. (U) The Air Force has completed a study of the geothermal potential of USAF Bases. This report lists the power generation potential, space heating potential, and geothermal potential at each USAF base. This study discusses in detail the data available for those USAF bases which exhibit the greatest potential for use of geothermal energy. Bases with significant potential that are discussed in detail include: Mountain Home (space heating), Saylor Creek Range at Mountain Home (power), Ellsworth Air Force Bases (space heating), Keesler Air Force Base (geopressurized geothermal resource), Hill Air Force Base (space heating), and William Air Force Base (power) in the Continental United States and Bellows Air Force Base, Hawaii (power). Lajes Air Force Base, Azores (power), and Ankara Air Station, Turkey (space heating) outside of the Continental United States. Open literature and unpublished field studies provided the basis for evaluation. (Author)

DESCRIPTORS. (U) \*geothermal, \*air force facilities, \*heating, \*power supplies, \*natural resources, \*steam, \*volcanoes, \*geology, \*Azores, \*Hawaii, \*Utah, \*land use

IDENTIFIERS. (U) Hot Springs \*Geothermal energy

AD-A082 154

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTPOL NO 035028

AD-A061 821 13/2 12/1

AD-A061 804 13/12 1/2 1 /8

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

NAVAL RESEARCH LAB WASHINGTON D C

(U) Air Force Refuse-Collection Scheduling Program  
Description Volume II Program PHASE2

(U) New Agents for the Extinguishment of Magnesium Fires

DESCRIPTIVE NOTE. Final rept Aug 76-Sep 77.

MAY 78 131P

APR 78 30P

PERSONAL AUTHORS Tuzzolino, Harold J , Murphy, Edward P ,  
REPORT NO. CERF-CC-20PERSONAL AUTHORS Lawrence, Kenneth D , Williams, Frederick  
W ; Gann, Richard G

CONTRACT NO. F28001-78-C-0018

REPORT NO NRL-6180-378-KDL-FWV-NJS

MONITOR. CEEDO  
TR-78-23-VOL-2

CONTRACT NO NIPR-FY8952-78-05017

PROJECT NO 414N

TASK NO 10

## UNCLASSIFIED REPORT

MONITOR CEEDO  
TR-78-19

SUPPLEMENTARY NOTE. See also Volume 3. AD-A060 288

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes program PHASE2, the  
second of four programs in the Air Force Refuse-  
Collection Scheduling Program. Program logic, input,  
output, and limitations are presented in detail. Some  
recommendations for changes, a program listing, and  
sample output are included. (Author)ABSTRACT. (U) Ground glass powders (frits) have been  
evaluated as possible suppressants for magnesium fires.  
Conceptually, these would melt and form a glass coating  
on the surface of the burning metal, isolating it from  
the oxygen supply. Some frits containing oxides of  
magnesium and lithium reacted violently with the burning  
magnesium. However, several low melting frits proved to  
be good suppressants and were better than commercial  
suppressants. (Author)DESCRIPTORS: (U) \*Refuse collection, \*Scheduling, Air  
Force procurement, \*Waste (Sanitary engineering), Computer  
programs, Military facilities, \*Submarines, Military  
facilities, \*Health input output processing

IDENTIFIERS (U) \*BRYTRAM

DESCRIPTORS (U) \*Fire extinguishing agents, \*Aircraft  
fires, \*Magnesium alloys, \*Aircraft tires, \*Wheels,  
Explosions, Landing, High velocity, Braking, Frit, Glass,  
Powders, Fire suppression, Lithium alloys, MeltingIDENTIFIERS (U) LPN-AFCEC-P0-77-10, WUCED0414N1005,  
PEG4714F

AD-A061 821

AD-A061 804

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AD-A081 532 21/5 21/2 12/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO CS5028

AD-A081 532 CONTINUED

SCOTT ENVIRONMENTAL TECHNOLOGY INC PLUMSTEADVILLE PA

(U) Air Force Turbine Engine Emission Survey United States, Volume 1. Test Summaries

Hydrocarbons, Nitrogen oxides, Sulfur oxides, Measurement, Combustion products, Afterburning, Power levels

IDENTIFIERS (U) PCS773F, WCEED0021032A10

DESCRIPTIVE NOTE. Final report Jan 73-Jun 78.

AUG 78 198P

PERSONAL AUTHORS: Souza, Anthony F. Daloy, Peter S.

REPORT NO 52T-1482-80-0877-VOL-1

CONTRACT NO. F286UJ-76-C-0040

PROJECT NO. 2103

TASK NO. 2A

MONITOR CEEDO  
TR-78-34-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A081 535

ABSTRACT: (U) The gaseous exhaust emissions from 14 military gas turbine engines were measured at various power levels (100%, 75%, 50%, and 25%) during engine operation. The test results are presented in this report. All measurements were made using the Air Force Mobile Emissions Laboratory which is a self-contained state-of-the-art gas turbine emissions test laboratory. Emission rates of hydrocarbons, carbon monoxide and oxides of nitrogen were calculated. The emission rate of sulfur oxides was estimated from fuel analyses. The body of data was analyzed to show relationships among the data. These studies included the effect of power setting on emissions index and smoke number. Variation of gas concentrations across the exhaust plume and the degree of uncertainty introduced by abbreviated sampling methods. A summary table of 'best estimate' emission factors for all the engines tested is provided (Author)

DESCRIPTORS (U) Gas turbines, Aircraft engines, Emissions, Air pollution, Exhaust gases, Turbojet engines, Turboprop engines, Turbofan engines, Afterburners, Smoke, Particulates, Carbon monoxide.

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DTIC REPORT BIBLIOGRAPHY

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AD-A001 483

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13/2

SCOTT ENVIRONMENTAL TECHNOLOGY INC PLUMSTEADVILLE PA

(U) U.S. Air Force Turbine Engine Emission Survey Volume  
III. Engine Model Summaries.

DESCRIPTIVE NOTE: Final rept Jan 75-Jun 78.

AUG 78

98P

PERSONAL AUTHORS: Sauer, Anthony F ; Daley, Peter S .

CONTRACT NO. F29601-78-C-0046

PROJECT NO. 2103

TASK NO. 2A

MONITOR: CREDO

TR-78-34-VOL. 3

UNCLASSIFIED REPORT

Availability: Document partially illegible

SUPPLEMENTARY NOTE: See also Volume 1, AD-A001 532

ABSTRACT: (U) The gaseous exhaust emissions from 14 different gas turbine engines were measured at various power levels from idling to full power including afterburning. SAE smoke number was determined. The body of the report analyzes the effect of power setting on these studies. Included are the exhaust gas temperature index and smoke number, variation of gas concentrations across the exhaust plume and the degree of uncertainty introduced by abbreviated sampling methods. A summary table of 'Best Estimate' emission factors for all the engines tested is provided.

DESCRIPTORS (U) Gas turbine, Aircraft engines, Emission, Air pollution, Turbojet engines, Turbofan engines, Turboshaft engines, Afterburners, Smoke, Particulates, Fuel/air ratio, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Sulfur oxides, Combustion products, Afterburning, Power levels

IDENTIFIERS (U) WUCED021032A10, PB8375JF

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AD-A001 369

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AD-A001 295 1/5 21/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 059028  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 THOMAS AFB FL DETACHMENT 1 (ADTC)  
 (U) Measurement and Analysis of Airport Emissions  
 DESCRIPTIVE NOTE: Interim rept 1 Mar 77-1 Jul 78.  
 SEP 78 21P  
 PERSONAL AUTHORS: Orley, Peter S.  
 REPORT NO: CEEDO-TR-78-30  
 PROJECT NO: 2103  
 TASK NO: 5A

## UNCLASSIFIED REPORT

ABSTRACT: (U) This paper is of interest to those involved in regulation and analysis of aircraft related air pollution problems. USAF efforts to measure and model airport pollution are summarized. Efforts include (1) a joint EPA study at Williams AFB, AZ which involves both modeling and measurement, (2) photographic studies to track plume rise, (3) theoretical model studies to analyze airport pollution. The author concludes that the Williams study, soon to be completed, will greatly aid in determining the accuracy of air quality modeling studies. It is shown that state-of-the-art Air Force engines cannot be cost effectively modified to reduce pollution except possibly in the hydrocarbon area and that, at present, unpredictable thermal plume rise of aircraft exhaust renders model ineffective at locations close (<1 km) to the source. (Author)

DESCRIPTORS: (U) Airports, Air pollution, Emission, Aircraft exhaust, Air force facilities, Models, Measurement, Cost effectiveness, Modification, Environmental management, Turbines, Engines, Emission control, Case studies, Hydrocarbons, Thermal pollution, Plumes

IDENTIFIERS (U) PE83723F, WUCEED021035A28

AD-A001 295

AD-A001 120

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AD-A080 937 19/2 171C REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A080 937

AD-A080 936

13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WIND CIVIL  
ENGINEERING RESEARCH FACILITY

NEW MEXICO UNIV ALBUQUERQUE ERIC H WIND CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Air Force Refuse Collection Scheduling Program  
Description, Volume IV, Program Phases.

(U) Air Force Refuse Collection Scheduling Program  
Description, Volume III, Program Phases

DESCRIPTIVE NOTE: Final report Jan 78 for 77.

DESCRIPTIVE NOTE: Final report Jan 78-Apr 77.

JUL 78 161P

JUL 78 267P

PERSONAL AUTHORS: Iuzzolino, Harold J.; Sfend, Patricia.

PERSONAL AUTHORS: Iuzzolino, Harold J.;

REPORT NO CERF-EE-23

REPORT NO CERF-EE-21

CONTRACT NO. F2801-78-C-0018

CONTRACT NO. F2801-78-C-0018

WORK UNIT: CEEDO

WORK UNIT: CEEDO

TR-78-23-VOL-1

TR-78-22-VOL 3

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-A080 936

SUPPLEMENTARY NOTE: See also Volume 4, AD-A080 937

ABSTRACT: (U) This report describes program PHASEA, the fourth of four programs in the Air Force Refuse Collection Scheduling Program, program logic, input, output, and limitations are presented in detail. Some recommendations for changes, a program listing, and sample input and output are included. (Author)

ABSTRACT: (U) This report describes program PHASEB, the third of four programs in the Air Force Refuse Collection Scheduling Program. Program logic, input, output, and limitations are presented in detail. A program listing and sample output are included. (Author)

DESCRIPTORS: Air Force, Refuse collection, Air Force, Scheduling, Algorithms, Computer programs, Input output processing

DESCRIPTORS: (U) Refuse collection, Air Force, Scheduling, Algorithms, Computer programs, Input output processing

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AD-A080 936

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 085028

AD-A000 853 12/1

STANFORD UNIV CALIF DEPT OF STATISTICS

(U) On the Half-Sample Method for Goodness-of-Fit

DESCRIPTIVE NOTE Technical Report

JUL 78 18P

PERSONAL AUTHORS: Stephens, Michael A

REPORT NO. TR-260, TR-20

CONTRACT NO N00014-78-C-0478, DAA028-77-Q-0031

UNCLASSIFIED REPORT

ABSTRACT. (U) Two interesting processes, related to the empirical distribution function, have been pointed out by Rao (1972) and by Durbin (1973). The second, in particular, leads to the half-sample method, an elegant and simple technique for dealing with unknown parameters in goodness-of-fit testing, without the necessity of new tables of percentage points for each distribution tested. To those who have spent some effort in producing such tables, this note is dedicated. It is hoped that this paper is not in vain. This paper shows that the answer is no.

DESCRIPTORS: (U) \*Distribution functions, \*Statistical tests, Tabulas(Date), Exponential functions, Normal distribution, Normalizing(Statistics), Chi square test

IDENTIFIERS: (U) Goodness of fit tests, WARR042207

AD-A000 842 21/5 21/2 13/2

SCOTT ENVIRONMENTAL TECHNOLOGY INC PLUMSTEADVILLE PA

(U) J57-S9W Engine Emission Test Report.

DESCRIPTIVE NOTE Final rept. Nov 78-Dec 77.

JUL 78 94P

PERSONAL AUTHORS Souza, Anthony F, Scott, Harold A, Jr.

REPORT NO SET-1028-02-1177

CONTRACT NO F04833-77-C-0210

WHITCR CELDO

TR-7A-37

UNCLASSIFIED REPORT

ABSTRACT: (U) The exhaust emissions from three J57-S9W water injected turbojet engines were measured. Emission rates of hydrocarbons, carbon monoxide and oxides of nitrogen were calculated. Smoke opacity and particulate loading were also measured. Best estimate emission factors are presented. (Author)

DESCRIPTORS: (U) \*Turbojet engines, \*Exhaust gases, Water injection, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Smoke, Opacity, Particulates, Measurement, Test methods, Sampling, Air pollution

IDENTIFIERS: (U) J-57 engines, J-57-P-S9W engines

AD-A000 853

AD A000 842

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A000 488 13/1

AD-A059 993 21/4 11/12 2/8

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADIC)CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADIC)(U) Third Interim Technical Report on USAFA Solar Test  
House Design Parameters.(U) FLAME - Forestry Lands Allocated for Managing Energy.  
Feasibility Study

DESCRIPTIVE NOTE: Rept for May 77-Apr 78.

DESCRIPTIVE NOTE Final rept. Jun-Aug 78.

SEP 78 184P

SEP 78 26P

PERSONAL AUTHORS: Eden, Anthony ; Tinsley, John T. ;

PERSONAL AUTHORS: Lowther, James O. ;

REPORT NO. CEEDO-TR-78-32

REPORT NO CEEDO-TR-78-41

UNCLASSIFIED REPORT

PROJECT NO 2103

TASK NO. 30

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates. All  
BDC reproductions will be in black and white.

ABSTRACT: (U) This report describes the continuing performance of the first retrofit-constructed, solar-heated facility in the USAF, the Solar Test House at the USAF Academy. Continued efforts to improve the performance have been a further reduction of the storage tank volume and installation of make-up water system to the tank. Studies started during the previous research period were completed and the techniques of using this advanced procedure for displaying flow patterns validated. The data analysis for the Solar Test House shows the improvement to the efficiency of the total system's ability to supply the thermal energy to the structure. Finally, the various parameters used to design the solar energy systems originally are analyzed and shown to be valid for this application (Author)

DESCRIPTORS: (U) \*Solar heating, \*Heating plants, Performance (Engineering), Efficiency, Housing (Dwellings), Prototypes, Energy storage, Heat transfer, Heat exchangers

IDENTIFIERS: (U) LHM-CEEDO-20-DTC-8-108

ABSTRACT: (U) This study evaluated the feasibility of using wood grown on USAF installations as fuel to supply the heating energy requirements of the installations, replacing conventional fossil fuels currently being used in the heating development center. The study was conducted by the USAF Engineering Development Center, Tyndall AFB, Florida, and the USAF Air Force Range, Avon Park, Florida. The study evaluated the potential for supplying significant portions of their heating energy requirements with non-merchantable timber grown on the installations. Avon Park Air Force Range, Florida has the potential to supply its own small heating energy requirements plus those of MacDill AFB, which is 75 miles away. Arnold Engineering Development Center presently has a central plant heating system. The system can be converted to a wood-burning system by altering existing boilers or replacing them with boilers having wood-firing capability. The remaining installations do not have central plant heating systems, but use small natural gas and oil-fired heating units in individual buildings. Conversion of these installations to burn wood would require construction of a wood-fired central system or systems. An alternate method of converting these installations to burn wood is to convert the existing boilers to burn wood. The latter alternative cannot be implemented until a large scale, continuously operated pyrolysis unit is developed (Author)

AD-A000 408

AD-A059 993

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 058028

AD-A059 983 CONTINUED

AD-A059 978 21/5 0/0

DESCRIPTORS: (U) \*fuels, \*forests, \*wood, Feasibility  
 studies, Air Force facilities, Heating, Military  
 requirements, Costs

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNHALL AFB FL DETACHMENT 1 (ADTC)

IDENTIFIERS: (U) PE83723F, WUCED021038003

(U) Air Quality Analysis of Possible F-15 and A-10  
 Aircraft Engine Modifications to Reduce Pollution

DESCRIPTIVE NOTE Final rept May 77-May 78.

JUN 78 32P

PERSONAL AUTHORS: Naugle, Dennis F ; Daley, Peter S ; Scott,  
 Harold A , Jr;

REPORT NO CEED0-TR-78-35

PROJECT NO 2103

TASK NO 5A

UNCLASSIFIED REPORT

511

ABSTRACT. (U) The Air Force has established goals for the control of aircraft engine exhaust emissions. Neither the F-15 nor A-10 aircraft engines completely meet these goals even though they are much less polluting than the F-4E and A-7 aircraft they often replace. This study compares air quality impacts of all four aircraft and shows the relative improvements possible with a modification/retrofit program for the F-15 and A-10 aircraft. Significant improvement is obtainable only for the A-10 hydrocarbon emissions. A five step analytical methodology is presented and can be adapted to nearly any aircraft related air quality assessment problem. (Author)

DESCRIPTORS: (U) \*turboprop engines, \*gas turbines, \*modification, \*exhaust gases, \*emission control, Systems analysis, Specifications, Air pollution, Impact, Air quality, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Smoke, Test and evaluation, Fighter aircraft, Jet bombers

IDENTIFIERS: (U) A-10 aircraft, F-15 aircraft, F-4E aircraft, A-7 aircraft, F-100 aircraft, PE83723F  
 WUCED021035A21

AD-A059 983

AD-A059 978

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 055028

AD-A059 957

13/2 11/6

AD-A059 957 CONTINUED

MISSOURI UNIV-COLUMBIA DEPT OF CIVIL ENGINEERING

(U) Optimum Dewatering and Metal Recovery of Metal Plating Waste Sludges.

DESCRIPTIVE NOTE: Final rept May 70-Feb 78.

KAR 70 78P

PERSONAL AUTHORS: Novak, John T, Holroyd, John, Pattengill, Larry, Grosh, McGarrah H.

CONTRACT NO. F0823A-76-C-0223

PROJECT NO. 2103

TASK NO. 7W

MONITOR: CEEDO  
TR-78-15

UNCLASSIFIED REPORT

ABSTRACT: (U) Bench scale experimentation was initiated to evaluate the solubilities and sludge characteristics associated with selected heavy metals and their hydroxides for both homogeneous and heterogeneous solutions. Data suggests that in a mixed-metal solution, lead-metal co-precipitants form and the point of zero charge (PZC) for these precipitants depends upon the specific metal content of the colloidal precipitants. In general the presence of chromium (III) depresses the overall PZC while nickel and cadmium, when major waste component, tend to raise the PZC. Aging was found to impact chromium hydroxide dewatering but it is not clear that the theoretical aspects of aging chemistry can be used to predict changes. High molecular weight anionic polymers were effective in conditioning metal sludges with respect to cake formation/filtrate clarity but help dewatering rates very little. Previously developed relationships for inorganic sludges which allowed filtration of about sand bed, centrifugation, and vacuum filtration data were used to predict dewatering rates for metal sludges. Based on these relationships and the laboratory data gathered here it is concluded that vacuum filtration is the only reasonable process to insure a handleable sludge if direct reclamation of the metals from the mixed

AD-A059 957

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 085028

AD-A059 511 13/2

SCS ENGINEERS LONG BEACH CALIF  
(U) Cascade Water Reuse

DESCRIPTIVE NOTE: Final report Oct 74-Dec 76.

JUL 77 84P

PERSONAL AUTHORS: Schmidt, Curtis J ; Clements, Ernest V ;  
III; Shelton, Stephen P. ;

CONTRACT NO F29601-79-C-0019

PROJECT NO. 2103

TASK NO. 6W

MONITOR: CEEDO  
TR-77-18

AD-A059 511 CONTINUED

77-28: a description of the software is published as  
CEEDO TR-77-28 (Author)DESCRIPTORS: (U) Water quality, Waste water, Air  
force facilities, Waste treatment, Water treatment,  
Water pollution, Water programs, Computer applications, Costs,  
Cost effectiveness, Tables (Data)

IDENTIFIERS: (U) WJCEED021038W45, PE33723F

## UNCLASSIFIED REPORT

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ABSTRACT: (U) This water reuse model described in this report was developed to assist Air Force personnel in reusing wastewater on Air Force bases. The model aids in selecting the most cost effective networks for wastewater collection, treatment and reuse in base activities. The model is comprised of two separate phases. Phase I provides a basis activities summary to simplify and clarify renewable cascade couplings between activities. With this as a foundation, feasible activity cascade networks can be developed for input into Phase II of the model. Phase II provides the following data for each of these networks: (1) Required treatment and storage facilities, (2) Estimated total reuse system costs (water purchase, discharge fees, piping, pumping, storage, and treatment in developing this model), the contractor gathered pertinent information relating to water quality and quantity demands of various base activities and the extent of degradation through use. This information, along with specific data gathered at individual bases, was used to test the cascade reuse model at Davis-Monthan and March Air Force Bases to evaluate reuse potential at Andrews Air Force Base and to aid in the conception and actual design of treatment and reuse facilities at Peterson Air Force Base. The users manual for use of the computer software for this model is published as CEEDO TR-

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 095028

AD-A059 407 7/3 13/2 12/1 AD-A059 121 1/5 15/5 11/4  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) The Evaporation and Dispersion of Hydrazine  
 Propellants from Ground Spills.

DESCRIPTIVE NOTE: Final rept. Jul 77-Jul 78.

AUG 78 54P

PERSONAL AUTHORS: 1119, DeWard; Springer, Charles ;

REPORT NO. CEEDO-TR-78-30

PROJECT NO. 1000

TASK NO. 5A

UNCLASSIFIED REPORT

ABSTRACT: (U) A propellant evaporation and dispersion model has been developed for hydrazine ground spills. The evaporation algorithm computes the rate of evaporation as a function of soil temperature, solar irradiation, air temperatures, wind velocity and spill dimensions. The mixing source Gaussian dispersion portion computes the downwind, ground-level centerline concentration based on dispersion coefficients available in current EPA models. The dispersion algorithm also computes the downwind dispersion algorithm corridor defined by the Short Term Public Limit (STPL) on other selected concentrations.

DESCRIPTORS: (U) hydrazine, air pollution, mathematical prediction, spilling, ground level, dispersants, evaporation, air quality, environmental tests, algorithms, computer programs, machine coding, soil mechanics, solar radiation, wind velocity, hazardous materials

IDENTIFIERS: (U) WUCCEED019005A35, PE62861F

AD-A059 407

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AD-A059 121

PAGE 379 055028

(U) An Investigation into the Use of Polymer-Concrets for  
 Rapid Repair of Airfield Pavements

DESCRIPTIVE NOTE: Final rept Jun-Dec 77.

JAN 78 127P

PERSONAL AUTHORS: McMerney, Michael T ;

REPORT NO. CEEDO-TR-78-10

PROJECT NO. 2104

TASK NO. 2B

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Master's thesis.

ABSTRACT: (U) An investigation of a high-strength, fast setting mixture of methyl methacrylate and dry aggregate was conducted. The resulting polymer-concrete (PC) was very strong, durable, and bonded excellently to concrete. Tests were conducted to determine the variables affecting the polymerization time and strength of polymer-concrete. Field tests were conducted to interstate highways and a major airport taxiway which demonstrated the feasibility of making rapid polymer-concrete repairs at a reasonable cost. Laboratory tests of a 3-foot by 8-foot area repaired by PC and an individual PC slab under repeated loadings of 50,000 lb and 100,000 lb showed that the PC demonstrated the excellent strength and quality of the material. A cost analysis found the cost of polymer to be approximately \$10/cubic foot for most repairs. (Author)

DESCRIPTORS: (U) Runways, Taxiways, Repair, Composite materials, Polymers, Concrete, Pavement bases, Laboratory tests, Stress analysis, Failure (Mechanics), Materials laboratories, Tensile strength, Road damage, Maintenance, High strength, Theses

IDENTIFIERS: (U) PE63723F, WUCCEED021042827

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
AD-A058 800 CONTINUED

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN  
ILL

(U) Development of a Pavement Maintenance Management  
System. Volume V. Proposed Revision of Chapter 3.  
AFR 93-5.

DESCRIPTIVE NOTE Final rept Jul 78-Sep 77.

OCT 77 193P

PERSONAL AUTHORS: Shahin, Mohamed Y., Carter, Michael I ;  
Kohn, Starr D. ,

REPORT NO. CERL-TR-C-78-VOL-5

PROJECT NO. 2104

TASK NO. 3M

MONITOR: CEEVO  
TR-77-44-VOL-5

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Volume 1, AD-A048 884

ABSTRACT: (U) The Air Force has for several years been actively engaged in the development of a Pavement Maintenance Management System. The first accomplishment of this study was the development of improved procedures concerning the relative condition of airfield pavements. This report presents the procedures developed in detail in this report. These procedures were developed during FY 76 and 77 and validated by field tests during FY 76 and 77. Two conferences, attended by Command Pavement Engineers from all Major Commands, have been held at Tyndall AFB, Florida (30 Nov - 2 Dec 1976, 18 - 20 October 1977), to discuss and revise these procedures. It was the consensus of the attendees at these conferences that these procedures provided vastly improved methods for determining the relative condition of airfield pavements. Thus, CEEDO was requested, during the conference held in October 1977, to publish, in some form, instructions for the use of these procedures as soon as possible. As a result this technical report is being published in the same format as that used for Chapter 5, 'Airfield Pavement Condition Survey Report.'

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AD-A058 860

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A058 802 13/13 13/7

AD-A058 243 13/2 7/3 11/7 14/2

NAVAL RESEARCH LAB WASHINGTON D C

(U) Comparative Nozzle Study for Applying Aqueous Film Forming Foams on Large-Scale Fires.

DESCRIPTIVE NOTE: Final rept. Nov 70-Sep 77.

APR 78 48P

DESCRIPTIVE NOTE: Final rept Jul 70-Sep 77.

PERSONAL AUTHORS: Jablonski, Edwin J ;

REPORT NO. NML-0180-187-EUJ-HUS

PROJECT NO. 414N

TASK NO. 40

MONITOR: CEEDO  
TR-78-22

APR 78 87P

PERSONAL AUTHORS: Matthews, James R ; Pierce, Glenn D ;

CONTRACT NO F2801-78-C-0015

PROJECT NO 2103

TASK NO. 2C

MONITOR: CEEDO  
TR-78-1

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

516

ABSTRACT: (U) A large-scale fire test program was conducted to evaluate the relative fire-fighting effectiveness of applying aqueous film-forming foams (AFFF) through completely air-aspirating and non air-aspirating nozzles. The Navy RB-104 and Air Force P-4 aircraft fire-rescue vehicles were used in nozzle test-backs. Nozzles with rated capacities of 250, 500, 750 and 1000 gpm were tested and evaluated on 4000 square foot and 8000 square foot JP-4 fuel fires, respectively. Eight of the 16 fires conducted contained longer reach aqueous film-forming foams generated with the non air-aspirating type nozzles were found to provide superior fire extinguishing effectiveness compared to the air-aspirating type nozzles. Air-aspirated foams required approximately 50 percent longer to achieve 90 percent fire control than the non air-aspirated foams. No discernible difference in burnback resistance was found for either type of foam. (Author)

DESCRIPTORS: (U) Fire fighting, Spray nozzles, Fire extinguishing agents, Foam, Test and evaluation, Comparison, Aircraft fires

IDENTIFIERS: (U) LPN-AFCEC-PD-77-018, NUCCEED0414N001, PE64714F

AD-A058 802

AD-A058 243

UNCLASSIFIED

PAGE 3C1 055028

ABSTRACT: (U) The Organics-Carbon Adsorbable minifilter procedure was used to recover refractory organics from treated wastewater. Ten carbon chloroform extracts were recovered with this procedure. A parallel run using treated versus non-treated carbon beds was made to compare the recovery efficiencies of the beds. Five parallel runs were made to compare the ability of activated carbon and XAD-2 macroporous resin to adsorb trace organics. An improved recovery system was developed and evaluated. This system recovered a greater organic mass per gram of carbon and per unit volume of sample than the Organics-Carbon Adsorbable minifilter and gave measurable recoveries in 24 hours.

DESCRIPTORS: (U) Wastewater, Organic compounds, Refractory materials, Liquid chromatography, Activated carbon, Refractory materials, Effluents, Environmental tests, Adsorbents, Chloroform, Extraction, Beds (process engineering), Trace elements, Samplers, Filters, Biochemical oxygen demand

IDENTIFIERS (U) PE63723F, NUCCEED021032C44



UNCLASSIFIED

DYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A058 238 21/4 7/3

AD-A058 239 CONTINUED

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNALL AFB PL DETACHMENT 1 (ADIC)

IDENTIFIERS (U) PG02801F, WUCED019004C01

(U) Oxidation of Hydrazine in Aqueous Solutions

DESCRIPTIVE NOTE: Interim rept. 6 Jan 77-1 Jan 78.

MAR 78 37P

PERSONAL AUTHOR: MacLaughlin, Michael G. ; Unda, Gregory A  
; Bowden, Sam E. ;

REPORT NO. CEED0-TR-78-11

PROJECT NO. 19N0

TASK NO 4C

UNCLASSIFIED REPORT

617

ABSTRACT: (U) The expanded use of hydrazine type fuels throughout the Air Force makes it imperative that current and accurate data be available on the potential environmental hazards of these compounds. This report describes the chemistry of hydrazine in aqueous solutions under varying conditions of temperature, pH, ionic strength, salinity, hydrazine concentration, oxygen concentration, and in the presence of catalysts, and solid substrates. Results indicate that in the absence of Copper 2 as a catalyst, the degradation of hydrazine is slow. In five days a 1 x ten to the minus 4th power molar solution of hydrazine degraded less than 2% in distilled water, 40% in pond water and 20% in seawater. The addition of oxide and clay solids did not change the rate of degradation. Increasing the concentration of Copper 2 caused a major increase in the oxidation rate as did increasing temperature. Salinity and ionic strength changes caused minor variations in rate. The maximum degradation rate occurs between pH 6 and 8. Oxygen concentrations in the range 0.5 to 40 mg/l had no measurable effect. (Author)

DESCRIPTORS: (U) Aviation fuels, hydrazine, Oxidation reactions, Water soluble materials, Environmental protection, Temperature, pH factor, Ionization, Salinity, Concentration (Chemistry), Oxygen, Catalysts, Distilled water, Sea water, Copper, Clay, Monopropellants

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 058028

AD-A058 575 1/5

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN  
ILL(U) Development of a Pavement Maintenance Management  
System for Army III Maintenance and Repair Guidelines  
for Airfield Pavements

DESCRIPTIVE NOTE: Final rept 1 Oct 78-30 Sep 77.

SEP 77 122P

PERSONAL AUTHORS: Shahin, Mohamed Y ,Darter, Michael I ,  
Kohn, Starr D ;

REPORT NO. CERL-TR-C 78-VOL-3

PROJECT NO. 2104

TASK NO. 3M

MONITOR: CEEDO  
TR-77-44-VOL-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A048 884

ABSTRACT: (U) This report describes the development of guidelines for determination of maintenance and repair (M and R) needs of airfield pavements. The guidelines are based on the pavement condition index (PCI) and other condition indicators, including rate of deterioration, cause of deterioration, load carry capacity, skid resistance/hydroplaning, surface roughness, and extent of previous M and R. The M and R actions were divided into three general categories: routine, periodic, and overall. The mean pavement PCI was determined and related to M and R needs reported by these three M and R categories and incorporated into the selection of appropriate M and R actions. Other condition indicators are used to further aid in the selection of feasible M and R alternatives. Recommended M and R methods for the different distress types and severity levels were developed. Economic analysis procedures were developed for comparing M and R alternatives. The airfield pavement condition survey and rating procedures have been successfully field-tested. Performing the condition survey according to these

AD-A058 575

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A058 172 13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY(U) Refuse-Collection Scheduling for Selected Locations  
Volume III Fairchild Air Force Base, Washington

DESCRIPTIVE NOTE: Final technical rept Jan 78-Apr 77,

NOV 77 82P

PERSONAL AUTHORS Iuzzolino, Harold J ;

REPORT NO CERF-EE-10

CONTRACT NO F29601-70-C-0015

MONITOR CEEDO

TR-77-54-VOL 3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 4, AD-A055 718

ABSTRACT. (U) This report presents maps and schedules produced by the Air Force Refuse Collection Scheduling Program for residential refuse collection at Fairchild Air Force Base, Washington. The data required for scheduling are discussed briefly. The computer-generated schedule reduced the number of trips from 10 to 8 and the total mileage from 272.8 to 264 miles (Author)

DESCRIPTORS (U) Refuse collection, Scheduling, Air Force facilities, Computer applications

AD-A055 987 13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY(U) Refuse-Collection Scheduling for Selected Locations  
Volume II Hill Air Force Base, Utah

DESCRIPTIVE NOTE: Final technical rept Jan 78-Apr 77,

NOV 77 48P

PERSONAL AUTHORS Iuzzolino, Harold J .

REPORT NO CERF-EE-15

CONTRACT NO F29601-70-C-0015

MONITOR CEEDO

TR-77-54-Vol-4

UNCLASSIFIED REPORT

Availability Document partially illegible

SUPPLEMENTARY NOTE See also Volume 3, AD-A056 172

ABSTRACT (U) This report presents maps and schedules produced by the Air Force Refuse-Collection at Hill Air Force Base, Utah. The data required for scheduling are discussed briefly. The computer-generated schedule reduced the number of trips from 4 to 3 and the total mileage from 53.4 to 44.5 miles (Author)

DESCRIPTORS (U) Refuse collection, Scheduling, Air Force facilities

AD-A056 172

AD A055 987

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## UNCLASSIFIED

AD-A055 980 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 AD-A055 710 13/2  
 NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
 ENGINEERING RESEARCH FACILITY  
 (U) Refuse-Collection Scheduling for Selected Locations  
 Volume 1 Offutt Air Force Base, Nebraska  
 DESCRIPTIVE NOTE: Final technical report Jan 78-Apr 77.  
 NOV 77 154P  
 PERSONAL AUTHORS: Iuzzolino, Harold J.;  
 REPORT NO. CERF-EE-13  
 CONTRACT NO. F28601-78-C-0015  
 MONITOR: CERF  
 TR-77-54-VOL-1

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A055 987  
 ABSTRACT: (U) This report presents maps and schedules produced by the Air Force Refuse-Collection Scheduling Program for dumpster-type refuse collection at Offutt Air Force Base, Nebraska. The data required for scheduling and the difficulties encountered in dumpster-type collection are discussed briefly. The total mileage of the three trips required to collect refuse was reduced from 40.3 to 38.7 miles. (Author)  
 DESCRIPTORS: (U) Refuse collection, Scheduling, Air Force facilities

AD-A055 980

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AD-A055 710

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Availability: Document partially illegible

SUPPLEMENTARY NOTE: See also Volume 1, AD-A055 980.  
 ABSTRACT: (U) This report presents maps and schedules produced by the Air Force Refuse-Collection Scheduling Program for residential refuse collection at Offutt Air Force Base, Georgia. The data required for scheduling are discussed briefly. The total mileage of the three trips from 27 to 23 and the total mileage from 148 to 124.3 miles. (Author)

DESCRIPTORS: (U) Refuse collection, Scheduling, Air Force facilities  
 Tables, Data

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CIVIL REPORT BIOLOGYGRAPHY

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CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AIR FL DETACHMENT 1 (ADTC)CONSTRUCTION ENGINEERING RESEARCH LAB (ASAC) CHAMPAIGN  
ILL

(U) The Autoxidation of Hydrazine Vapor

(U) Field Test of Building Energy Analysis Tools and  
Procedures

DESCRIPTIVE NOTE Final report Nov 78-Dec 77.

DESCRIPTIVE NOTE Interim report

JAN 78 48P

MAY 78 88P

PERSONAL AUTHORS: Stone, Daniel A.

PERSONAL AUTHORS: Hittle, Douglas C.

REPORT NO AEC-TR-78-17

REPORT NO CERL-IR-E-120

PROJECT NO 1000

PROJECT NO 4AT82731AT41

TASK NO 4C

TASK NO 08

UNCLASSIFIED REPORT

MONITOR: CERDO  
TR-77-38

ABSTRACT (U) Results of three studies on the ambient temperature autoxidation of hydrazine vapor are presented. These studies show that the main reaction is  $\text{H}_2\text{N}_2 + \text{O}_2 \rightarrow \text{N}_2 + 2\text{H}_2\text{O}$  with ammonia being produced as a side product. The rate of the main reaction, as well as the side reaction producing ammonia, is greatly influenced by the surface to volume ratio and the surface composition of the reaction vessel. Hydrazine half life varied from a few minutes to several hours depending upon experimental conditions. (Author)

DESCRIPTORS: (U) Hydrazine, Liquid, Rocket fuels, Oxidation, Air pollution, Air, Chemical reactions, Monopropellants, Volume, Surface properties, Environments, Nitrogen, Vapor, Ammonia

IDENTIFIERS: (U) PEG2801F, NUCEED019004C01

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the results of the field test of three building energy analysis tools. (1) The Building Loads Analysis and System Thermodynamics (BLAST) program, (2) Predicting the Performance of Solar Energy Systems, and (3) Use of the Building Loads Analysis and System Thermodynamics program to perform Total Energy System Analysis. Projects to which BLAST was applied included a flight simulator training facility, administrative buildings, and hangar construction. Building results showed that the tools can be used to design energy conservative buildings. However, extensive revision of the draft BLAST User's Manual was recommended. The recommended revisions were accomplished prior to the publication of the User's Manual in December 1977. Widespread dissemination and use of these energy analysis tools is recommended.

DESCRIPTORS: (U) Energy management, Buildings, Computer programs, Systems analysis, Energy consumption, Mathematical prediction, Energy conservation, Field tests, Air conditioning equipment, Testing, Performance (Engineering), Solar heating, Military facilities, Programming manuals

AD-A055 487

AD-A055 095

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL (U). 050028

AD-A084 184 21/9 13/2

AD-A085 085 CONTINUED

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)IDENTIFIERS. (U) BLASY computer program. PB02731A, AST41.  
MN21(U) Proceedings of the Conference on Environmental  
Chemistry of Hydrazine fuels, Tyndall AFB, 13  
September 1977

DESCRIPTIVE NOTE. Final rept.

MAR 78 102P

REPORT NO. CEEDO-IR-78-14

PROJECT NO 1800

TASK NO 4C

UNCLASSIFIED REPORT

ABSTRACT: (U) On 13 September 1977, the Civil and Environmental Engineering Development Office, ADTC, Tyndall AFB, Florida, hosted a conference on the environmental chemistry of hydrazine fuels used for missile fuels and monopropellants. A total of 14 papers were presented on the following topics: General topics related to hydrazine fuels; (1) Sources and Control of Fuels Emissions and Spills; (2) Environmental Monitoring Techniques and Instrumentation; (3) Analysis of Fuels and Degradation Products; (4) Fate of Hydrazines in the Environment (Author)

DESCRIPTORS (U) Hydrazine, Rocket fuels, Air pollution, Conferencing (Communications), Reports, Analytical chemistry, Exhaust gases, Emission control, Hydrazine derivatives, Degradation, Toxicity, Contamination

IDENTIFIERS: (U) WUCCEED019004C01, PE02801F

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AD-A0JA 194

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## DTIC REPORT BIBLIOGRAPHY

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AD-A053 087 21/5 13/2 1/3

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) Photographic Measurements of USAF Aircraft Plume Rise

(U) Subsonic Smoke Sampling Errors for Aircraft Turbine  
Engine Smoke Probes.

DESCRIPTIVE NOTE: Final rept 1 Jul-22 Nov 77.

NOV 77 3RP

DESCRIPTIVE NOTE: Final rept 15 Sep 77-12 Jan 78.

PERSONAL AUTHORS: Musick, Paul D ; Hunt, John S ; Naugle,  
Dennis V ;

APR 78 20P

PERSONAL AUTHORS: Martone, Joseph A ;

REPORT NO. CEEDO-TR-77-87

REPORT NO CEEDO-TR-78-20

PROJECT NO. 1800

PROJECT NO. 1800

TASK NO 2A

TASK NO 2A

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report includes data and results which were obtained during plume rise experiments. Aircraft plumes were photographed using the technique of producing F-102 drones and Thunderbird F-38 aircraft. The second set of experiments indicated that, under low wind and unstable conditions, the aircraft plume not only rises but completely separates from the ground. The other studies, however, indicate that under high wind and neutral conditions, the plume rise is greatly retarded and there is no significant ground separation. Differences in meteorology apparently account for these plume rise variations. Since the 13 tests performed are inadequate to understand the causes for the plume rise and ground separation, it is recommended that this study be extended in order to provide an explanation for this phenomenon.

DESCRIPTORS: (U) \*Exhaust plumes, \*Jet engine exhaust, \*Photographic analysis, \*Convection (meteorology), Lift, Air pollution, Air quality, Mathematical models

IDENTIFIERS (U) F-102 aircraft, F-38 aircraft, PE026U1F, MUCCE0018002A77

AD-A054 004

AD-A053 867

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. 058028

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CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

WOODWARD CLYDE ASSOCIATES SAN FRANCISCO CA

(U) Equipment to Neutralize Aircraft Fuel Spills

(U) Identification and Characterization of Elements for an  
Air Force Range Planning Document.

DESCRIPTIVE NOTE: Final rept Sep 78-Sep 77.

DESCRIPTIVE NOTE: Final rept Sep-Dec 77.

JAN 78

DEC 77 93P

PERSONAL AUTHORS: Munroe, Lee R. ;

PERSONAL AUTHORS: Liskam, William H ; Spight, Tom K ;

REPORT NO. CERDS-78-78-08

CONTRACT NO F08635-78-D-0134

PROJECT NO. 414N

PROJECT NO. 1997

TASK NO. 10

TASK NO. 9

## UNCLASSIFIED REPORT

MONITOR

CEED

TR-77-52

ABSTRACT: (U) This report describes the selection of type and sizes of equipment for the neutralization of small and other type fuel spills. Additionally, it deals with the procurement of subject equipment and materials and evaluation, on a comparative basis, for application to neutralization, and fabrication of various size fuel spills. Maximum use was made of US Army Mobility Equipment Research and Development Command's in-house facilities to design, assemble, fabricate, and test a pilot model system as described in the report. (Author)

DESCRIPTORS: (U) \*Aviation fuels, \*Oil spills, Water, Sensors, Army equipment

IDENTIFIERS (U) \*EG-714F, WUCCEED0414N1004

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report identifies and characterizes those elements which should be included in range planning documents which may be prepared for air-to-ground ranges. The report identifies nine major elements with each having from three to six subelements. The discussion on each element includes: Characterization; Rationale; Use of Element at Various Levels of Command; and Outline of Subelements. This report will be used during a follow-on range planning effort in land-use planning and compatible use zones. (Author)

DESCRIPTORS: (U) \*Ranges(Facilities), \*Air Force facilities, Test facilities, Weapon delivery, Air to surface, Site selection, Land use, Air force training, Missions, Air bases, Legislation, Air force planning, Environmental protection, Community relations

IDENTIFIERS: (U) \*EG-723F, WUCCEED018979P42

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AD A053 803

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A053 255 13/2

NEW MEXICO UNIV ALBUQUERQUE FRIC H WMR CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Air Force Refuse-Collection Scheduling Program

DESCRIPTIVE NOTE: Final technical rept. Dec 76-Apr 77.

JAN 78 71P

PERSONAL AUTHORS: Juzzolino, Harold J ;

CONTRACT NO. F2801-76-C-0018

MONITOR: CEEDO  
TR-77-32

UNCLASSIFIED REPORT

ABSTRACT: (U) Data preparation for and use of the four computer programs comprising the Air Force Refuse-Collection Scheduling Program (RCSP); are described. RCSP is used to produce maps and printed schedules for residential refuse collection (Author)

DESCRIPTORS: (U) Refuse collection, Scheduling, Routing, Air Force facilities, Computer programs, Maps, Algorithms, Waste management

AD-A053 103 14/11 11/7

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADIC)(U) Evaluation of a Brominated Resin System for  
Ferrycyanide Bleach Regeneration

DESCRIPTIVE NOTE Final rept Oct 74-Mar 75.

MAR 78 33P

PERSONAL AUTHORS Allen, Dale H ;

REPORT NO CEEDO-TR-77-4

PROJECT NO 210J

TASK NO 7W

UNCLASSIFIED REPORT

ABSTRACT (U) Brominated resins were evaluated in the laboratory for regenerating ferricyanide bleaches from Air force photoprocessing laboratories. Several resins were tested to determine bromine transfer rates. Results showed the technique is technically feasible but too complicated and hazardous for small photo labs (Author)

DESCRIPTORS: (U) Photographic materials, Photographic processing, Bleaching agents, Cyanides, Iron compounds, Bromination, Regeneration (Engineering), Chemical reactions, Photographic images, Photographic developers, Silver compounds, Particles, Oxidation reduction reactions

IDENTIFIERS (U) PB83723F, NUCEED021037N20

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
AD-A053 070 CONTINUED

TENNESSEE UNIV KNOXVILLE DEPT OF CIVIL ENGINEERING

(U) Development of a Regionalized Mathematical Model for Predicting Changes in Streamflow Quantity and Quality as a Function of Land Use, Soil Type and Rainfall Characteristics.

Valleys, Water distribution, Storms, Water resources IDENTIFIERS. (U) PE02001F, NUCEED019005M24

DESCRIPTIVE NOTE: Final report : Jun 78-1 Jun 77.

JAN 78 110P

PERSONAL AUTHORS: Overton, Donald E , Minear, Roger A , Shelton, Stephen P. ;

CONTRACT NO T08835-78-C-0247

PROJECT NO. 1800

TASK NO. 8W

MONITOR: CEEDO TR-77-18

## UNCLASSIFIED REPORT

ABSTRACT. (U) This study was designed to regionalize a mathematical model stormwater runoff which can be used for predicting changes in streamflow quantity and quality as a function of land use, soil type, and rainfall characteristics. A water quality index was developed which responds as a function of land use and hydrologic characteristics. The index includes physical, chemical, and biological parameters. The model was regionalized for immediate use in the Tennessee Valley on some watersheds up to approximately 10 square miles using hydrologic data from urban, agricultural, forested, and strip mined watersheds. However, in future studies the model can be regionalized to other parts of the United States by analysis of hydrologic air and water quality data in those regions utilizing the same scientific approach in this study in the Tennessee Valley. Results achieved from other regions can then be pooled with results achieved from the Tennessee Valley which would provide a more widely applicable model. (Author)

DESCRIPTORS: (U) Water flow, Runoff, Mathematical models, Water quality, Watersheds, Land use, Soils, Rainfall, Hydrographic surveying, Tennessee River.

AD-A053 070

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AD-A053 008 13/13  
 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 AD-A052 707 1/5 13/2 8/2  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALL AFB FL DETACHMENT 1 (ADTC)  
 (U) Hardwall Expandable Shelter  
 (U) Nondestructive Pavement Evaluation  
 DESCRIPTIVE NOTE. Final rept Apr 73-Aug 77.  
 SEP 77 88P  
 PERSONAL AUTHORS. Sug2, Joseph P.  
 REPORT NO CEED0-TR-77-45  
 PROJECT NO 2084  
 TASK NO. 20  
 OCT 77 22P  
 PERSONAL AUTHORS. Das, S. M.;  
 REPORT NO. CEED0-TR-77-41  
 PROJECT NO 2084  
 TASK NO 4P

## UNCLASSIFIED REPORT

ABSTRACT: (U) The Air Force awarded a contract to Brunswick Corporation for the development of a basic rigid/expandable shelter that would fulfill various user requirements with little or no change in shelter design. Furthermore, the shelter was to be compatible with both air and surface transport criteria. Extensive testing verified that the shelter meets these two basic criteria. However, design details need revision to improve water/tightness and reduce shelter gross weight. The Air Force should adopt the hardwall expandable shelter (HES) as a standard for meeting future tactical shelter requirements. (Author)

DESCRIPTORS: (U) Portable shelters, Expandable structures, Air transportable equipment, Shipping containers, Aluminum, Water/tightness, Stress testing, Honeycomb structures, Walls, Air force equipment.

IDENTIFIERS: (U) Hardwall expandable shelters.  
 WUCED020542102, PER4703F

AD-A053 008

AD A052 707

UNCLASSIFIED

PAGE 502 05502F

## UNCLASSIFIED REPORT

ABSTRACT: (U) Research has been in progress for about 10 years to develop a compatible pavement evaluation procedure for airfields based on nondestructive tests. A successful nondestructive pavement evaluation technique will reduce the time or closure of various airfield facilities needed to conduct destructive tests required for conventional pavement evaluation. This study provides a comparison of the proposed pavement tests and airfield features estimated by nondestructive and destructive pavement evaluation procedures for aircraft and gross loads on similar pavement sections. The nondestructive evaluation procedure yields higher numbers of allowable operations as compared to that obtained by the destructive test evaluation technique at this point in the research effort. Follow-on research is planned which will cause the two evaluation procedures to yield more closely compatible numbers. (Author)

DESCRIPTORS: (U) Runways, Nondestructive testing, Pavements, Life cycles, Comparison, Loads (forces), Destructive tests, Field tests, Elastic properties, Statistical analysis, Vibrators (Mechanical), Concrete, Modulus of elasticity, Computer programs, Shear properties.

IDENTIFIERS (U) WUCED020544W07, PER4703F

TAC NO NT-010260

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A052 707 CONTINUED

AD-A051 087 13/12 1/2

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

IAC SUBJECT TERMS: N--(U)PRAVEMENTS, RESEARCH, AIRPORTS, EVALUATION, FIELD TESTS, LIFE(DURABILITY), LOADS(FORCES), DESTRUCTIVE TESTS, SHEAR, ELASTIC PROPERTIES, STRUCTURAL ANALYSIS, AIRCRAFT, CONCRETE, MODULUS OF ELASTICITY, COMPUTER PROGRAMS, PROPERTIES.

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TINMILL AFB PL DETACHMENT 1 (AOTC)

(U) Fire Fighter Tools

DESCRIPTIVE NOTE. Final rept. 1 Oct 76-31 Oct 77.

JAN 72 DSP

PERSONAL AUTHORS: Knowles, Norman D. ;

REPORT NO CELDG-TR-78-2

PROJECT NO 414N

TASK NO 30

628

UNCLASSIFIED REPORT

ABSTRACT: (U) The Civil and Environmental Engineering Development Office (CEEDO) conducted an evaluation of aircraft crash rescue/fire fighting tools and equipment. This study was necessitated due to the continuing growth and development of new tools and the ever increasing numbers of tools being acquired by Air Force Fire Protection Organizations. The purpose of the study was to verify the concepts for fire fighting and rescue operations; to identify the tools and equipment presently carried on fire fighting and rescue vehicles; to determine the usefulness of all inventoried tools and equipment; and to determine a basic selection of tools and equipment that should be carried on fire fighting and rescue vehicles.

DESCRIPTORS: (U) \*fire fighting, \*fire extinguishers, \*fire fighting vehicles, \*aircraft fires, Crash landing, Rescue equipment, Rescue vehicles, Tools

IDENTIFIERS: (U) WUCLED0414N0001, PB84714F

AD-A052 707

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AD-A050 999 14/2 11/4 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
AD-A050 999 CONTINUED

GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL  
AMERICAN RESEARCH DIV

MODELS(SIMULATIONS), PROTOTYPES, DEVELOPMENT, RECOMMENDED  
PRACTICES, FIELD TESTS, BONDING, LAMINATES, PORTABLE  
EQUIPMENT, SANDWICH CONSTRUCTION, PANELS(STRUCTURAL),  
MOISTURE, ELECTRONIC EQUIPMENT;

(U) Nondestructive Inspection of Shelter Panels.  
Miniaturized Nondestructive Inspection Tester Model

DESCRIPTIVE NOTE: Final rept Mar 78-Jun 77.

JUL 77 17P

PERSONAL AUTHORS: Santoro, Michael J ;

CONTRACT NO. F33615-78-C-8278

PROJECT NO 2084

TASK NO 20

MONITOR: CEEDO  
TR-77-47

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Rept no AFCEC-TR-75-2, AD-  
A007 033

ABSTRACT. (U) This report summarizes the results of an effort to develop a miniaturized model of the nondestructive inspection prototype equipment developed under Contract F-33615-71-C-1552. The details of the initial equipment development have been documented in AFCEC-TR-75-2, Jan 1975. The miniaturized model has been successfully laboratory and field tested and the results of these tests are included along with conclusions and recommendations (Author)

DESCRIPTORS. (U) Test equipment, Nondestructive testing, Sandwich panels, Electronic equipment, Miniaturization, Shelters, Portable equipment, Moisture, Laminates, Field tests, Bonding

IDENTIFIERS. (U) PB84721F, WUCEE0020542004

IAC NO NT-016123

IAC DOCUMENT TYPE. NTIAC - MICROFICHE --

IAC SUBJECT TERMS. N--(U)TEST EQUIPMENT.

AD-A050 999

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 095028

AD-A050 223 8/8 1/3

AD-A050 223 CONTINUED

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

IDENTIFIERS: (U) PB03723F, WUCRE0021037A20

(U) Smoke Abatement for DoD Test Cells.

DESCRIPTIVE NOTE: Final rept 20 Nov 76-30 May 77.

JUL 77 108P

PERSONAL AUTHORS: Gress, Bradford C. III.

REPORT NO. CREDO-TR-77-40

PROJECT NO. 2103

TASK NO. 7A

UNCLASSIFIED REPORT

ABSTRACT (U) The Department of Defense owns and operates nearly 200 jet engine test cells. Occasionally, visible exhaust smoke is emitted from these structures. Several pollution control agencies, most notably the State of California, have expressed interest in limiting test cell smoke emissions. A review committee composed of various Air Force and Navy representatives recommended further study of fuel additives as a means of achieving this goal. They recognized additives as the most promising near term solution to the test cell smoke problem. Ferrocoke appeared to be the best of existing additives. Studies were undertaken to determine the environmental impact, toxicological hazards and engine efficiency associated with routine ferrocoke use. Four types of Navy turbojet engines were tested for ten hours each using ferrocoke. Test results indicated that the additive may have contributed to carrying the test cell individual basis. Emission measurements made during the tests showed that most pollutants are virtually unchanged in quantity and character by ferrocoke use and that particulate matter is actually reduced.

DESCRIPTORS: (U) \*Smoke abatement, \*Ferrocoke, \*Air pollution, \*Test facilities, Fuel additives, Environmental management, Jet engine fuels, Jet engine exhaust, Test fixtures, Cost analysis, Naval research, Air Force research, Test and evaluation, Air quality

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 055028

AD-A048 712 13/2 8/10 7/3

STANFORD UNIV CALIF DEPT OF CIVIL ENGINEERING

(U) The Role of Iron Sulfides in Controlling Trace Heavy Metals in Anaerobic Sediments: Oxidative Dissolution of Ferrous Monosulfides and the Behavior of Associated Trace Metals

DESCRIPTIVE NOTE. Final rept 5 Dec 74-4 Dec 76.

FEB 77 418P

PERSONAL AUTHORS: Nelson, Michael B ; Davis, James A . III; Benjamin, Mark W ; Leckie, James O .

CONTRACT NO. F28601-75-C-0028

PROJECT NO 2103

TASK NO. 4C

MONITOR CFEDD TR-77-13

UNCLASSIFIED REPORT

ABSTRACT: (U) The study of the kinetics of oxidation of the ferrous monosulfide macroinvertebrates and the rate of the associated heavy metals are described to better understanding of the processes and mechanisms controlling the release of heavy metals and retention of heavy metals in the sedimentary systems. This project undertook a detailed study of several selected aspects of the aqueous chemistry of heavy metals and of the oxidative dissolution of FeS(s) and the fate of associated heavy metals both during and after the oxidation reaction. The material is organized into sections dealing with the basic aqueous chemistry of iron and sulfur, silver, cadmium, adsorption models, experimental methodology results and discussion.

DESCRIPTORS (U) Iron, Sulfides, Heavy metals, Water pollution, Oxidation, Sediments, Cadmium, Silver, Adsorption, Ligands, Complex compounds, Chemical compounds, Particulates, Kinetics, Processes, Precipitates, Trace elements, Transport properties, Water quality, Environment, Wastes (Industrial), Plating, Photographic processing

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AD-A049 827 6/8 7/4 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALL AFB FL DETACHMENT 1 (ADTC)  
 (U) Chloroform Volatility.  
 DESCRIPTIVE NOTE: Final rept. Jun 75-May 77,  
 MAY 77 33P  
 PERSONAL AUTHORS: Stauffer, Thomas B.  
 REPORT NO CEEDO-TR-77-9  
 PROJECT NO. 2103  
 TASK NO 4C

AD-A049 480 12/1 10/1 10/2 13/2  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALL AFB FL DETACHMENT 1 (ADTC)  
 (U) A Survey of Considerations for Solar Energy Facility  
 Applications  
 DESCRIPTIVE NOTE: Final rept.,  
 DEC 77 85P  
 PERSONAL AUTHORS: Nay, Marshall W., Jr.  
 REPORT NO CEEDO-TR-77-38

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The volatility of technical grade chloroform from different surfaces was studied. The vapor concentration over a 72% water-saturated pooled liquid technical grade chloroform was 13 mg/l. The vapor concentration was also determined for Ottawa sand, gravel, and top soil. Technical grade chloroform is a complex mixture of chloroform and heptachlor isomers and conformers. It was found that the components of the technical grade pesticide volatilize from different surfaces at different rates. Individual component concentrations were measured over the various surfaces studied. The 't-test' was used to check for significant component volatilization differences from the various surfaces (Author)

DESCRIPTORS: (U) Chloroform, Volatility, Evaporation, Vapor Pressure, Surface properties, Concentration (Chemistry), Water soluble materials, Emulsions Sand, Gravel, Soil, Tests, Test equipment, Foundations (Structures), Test methods, Humidity, Air flow, Temperature, Humidity

IDENTIFIERS: (U) PER3723F, CEEDO21034C60

AD-A049 827

IDENTIFIERS (U) Environmental impact

IAC NO PL-900904

AD-A049 480

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ABSTRACT: (U) The purpose of this report is to provide Air Force civil engineers some useful information for the planning and programming of solar energy systems to satisfy facility energy requirements. This report has been prepared in response to the belief that considerable interest in solar energy system technology, as well as other alternate energy schemes, is increasing at a rapid pace in the Air Force. A considerable effort is devoted to updating the current status of fossil fuel energy resources in order to establish the need for expanded work in developing solar energy technology. The current technology areas of application of solar energy and potential areas of application of solar energy devoted to space heating. Additionally, environmental considerations of solar energy technology are described along with the current Air Force solar energy program. This report concludes with some suggestions for establishing a solar energy program on an individual or installation basis (Author)

DESCRIPTORS: (U) Solar heating, Air force facilities, Energy management, Solar energy, Solar collectors, Technology forecasting, Space heaters, Retrofitting, Cost estimates, Abortization, Air force planning, Fossil fuels, Resource management, Energy consumption, Energy conversion, Photovoltaic effect, Heat pumps, Air conditioning equipment, Military requirements, Remote areas



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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A049 490 CONTINUED

AD-A049 177 C/B 0/3 22/4

TAC DOCUMENT TYPE: PLASTIC - HARD COPY --

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
LYNNALL AFB FL DETACHMENT 1 (ADTC)

IAC SUBJECT TERMS P--(U)Solar energy systems, Management  
programs, Fuel cells, Flat plates, Space heating, Solar  
collectors, Military applications, Buildings, Residential  
applications, Cost estimations, Energy conversion,  
Heating systems, Cooling systems. ZZ MIDG, ZZ Unlimited.

(U) Impact of Space Shuttle Support Facilities  
Construction on Special Interest Plant Species  
(Vandenberg AFB, CA)

DESCRIPTIVE NOTE Final rept Jun-Sep 77.

SEP 77 8IP

PERSONAL AUTHORS Wooten, R C , Jr , Strutz, Dennis ;  
Hudson, Ronald ;

REPORT NO CEEDO-TR-77-33

PROJECT NO 2103

TASK NO 9

UNCLASSIFIED REPORT

ABSTRACT. (U) This report summarizes the results and conclusions of studies conducted to evaluate the impact of ground support facility construction for the Space Shuttle program at Vandenberg AFB, California on listed and proposed threatened or endangered plant species in order to comply with the Endangered Species Act of 1973. Vegetation surveys were made in proposed construction site areas. The listing used to determine threatened and endangered plant taxa were those plant species proposed as endangered or threatened in the 1975 Federal Register (40FR27824-27880) and those listed as endangered for rulemaking by the US Fish and Wildlife Service in the June 16, 1976 Federal Register (41FR452-24572). The surveys also included other special interest taxa designated by the California Native Plant Society as endangered taxa. The listed and proposed threatened or endangered plant taxa in California. Three threatened species (*Castilleja mollis*, *Monardella crispata*, and *Scrophularia atrata*) and two endangered species (*Cirsium rhotophyllum* and *Erigeron foliosus* var. *blochmanii*) were found in a number of the construction site areas. It was determined that construction activities would not jeopardize the continued existence of any of these species. Mitigative measures were recommended to minimize adverse plant habitat modification or removal of any of these plants (Author).

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DTIC REPORT BIBLIOGRAPHY

AD-A049 177 CONTINUED

DESCRIPTORS: (U) \*Ecology, \*Plants(Botany), \*Air Force facilities, \*Environmental impact statements, \*Contamination, \*Extinction, Threat evaluation, Space shuttles, Ground support, Sites, Construction, Environmental protection

IDENTIFIERS: (U) Vandenberg Air Force Base, WJCEED021039P13, PE83723F

SEARCH CONTROL NO. 055028

AD-A049 177 6/0 17/4

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) An Evaluation of Cladocera as a Bioassay Organism

DESCRIPTIVE NOTE Final rept 1 Oct 75-4 Feb 78

JUN 78 38P

PERSONAL AUTHORS: Scott, Claude L ; Moorehead, Annie .

REPORT NO AFCEC-TR-78-37

PROJECT NO. 2103

TASK NO 3E

UNCLASSIFIED REPORT

ABSTRACT. (U) The literature review of Cladocera, with special emphasis on Daphnia, was conducted to assess their use in aquatic pollution research and new methods to measure the effects of pollution on the aquatic ecosystem. A discussion on life cycle, metabolism, cyclomorphosis, filtering rate, culture techniques, toxicity, and taxonomy is included. (Author)

DESCRIPTORS. (U) \*Crustacea, Aquatic animals, Fresh water, Water quality, Indicators, Sensitivity, Bioassay, ecosystems, Environmental tests, Water pollution, Literature surveys, Ecology, Life cycles, Metabolism, Toxic tolerances, Taxonomy

IDENTIFIERS (U) \*Daphnia, Cladocera, WJAFCEC21033E18, PE83723F

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## DTIC REPORT BIBLIOGRAPHY

AD-A049 029 1/5 13/2 5/1  
CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN  
ILL

(U) Development of a Pavement Maintenance Management  
System, Volume 13 Airfield Pavement Distress  
Identification Manual

DESCRIPTIVE NOTE Final rept Jul 76-Jul 76.

DEC 77 11SP

PERSONAL AUTHOR: Shahin, Mohamed Y ;Darter, Michael I ;  
Kohn, Starr D ;

REPORT NO CERL-TR-C-76-Vol-2

CONTRACT NO NIPR-FQ882-76-06005

MONITOR CEEDO  
1R-77-44-Vol-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE Superceding Rept NO AFCEC-TR-76-27-  
VOL-2 dated Nov 76, AD-A042 083 See also Volume 1, AD-  
A048 384

ABSTRACT: (U) This manual is designed to provide  
airfield pavement inspectors with a comprehensive  
reference for pavement distress identification. The  
information is to be used in conjunction with procedures  
presented in Volume I of this report to determine  
pavement condition and maintenance and repair  
requirements. The types of airfield pavement distress are  
listed alphabetically under the major categories of  
asphalt- or tar-surfaced pavements and jointed concrete  
pavements. Names, descriptions, severity levels,  
prevalence, and measurement or count criteria are  
presented for each distress type (Author)

DESCRIPTORS: (U) Pavements, Surveys, Maintenance  
management, Concrete, Asphalt, Cracking(fracturing),  
Cracks, Classification, Loads(Forces), Repair, Surveys

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## SEARCH CONTROL NO 055020

AD-A048 982 13/1 9/2

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN  
ILL

(U) The Building Loads Analysis and System Thermo-Dynamics  
(BLAST) program Volume 1: Reference Manual

DESCRIPTIVE NOTE Final rept .

DEC 77 437P

PERSONAL AUTHORS Hittie, D C ;

REPORT NO CERL-TR-E-119-Vol-2

PROJECT NO 4A782731AT41, 2102

TASK NO 06, 01

MONITOR CEEDO  
TR-77-38-Vol-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 1, AD-A046 714

ABSTRACT: (U) The Building Loads Analysis and System  
Thermodynamics (BLAST) program is a sophisticated set of  
subprograms for predicting energy consumption in  
buildings. The four major subprograms are: the input  
processor, which parses the high level input language and  
sets up the building/systems/plant descriptors, the  
building loads subprogram, which computes the hourly  
space load in a building or zone based on the user's  
description of the building/zone and hourly weather data,  
the air distribution system simulation subprogram, which  
calculates the coil energy demands, fan power, etc.,  
based on the user's description of the air handling  
system and the hourly space load calculated by the  
previous subprogram, and the central energy plant  
subprogram, which calculates the total energy plant based  
consumption of a central/solar/total energy plant based  
on the user's description of the plant and the hourly  
coil loads calculated by the previous subprogram, and  
performs a life-cycle cost analysis of the plant. In  
addition to conventional boiler-chiller equipment, the  
central energy plant subprogram includes solar heating  
and cooling systems, total energy systems, and commercial  
utility systems. The program is written in Control Data

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 085028

AD-A047 829 13/2 14/2 21/2  
AD-1047 829 CONTINUED  
exhaust Supersonic flow, Particles, Air Force research,  
Probes  
IDENTIFIERS (U) Sonic flow, Subsonic flow, Particles,  
Isokinetic sampling, P02501F, M08ADP19002025

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
THRELL AFB FL DETACHMENT 1 (ADIC)

(U) Sampling Subsonic flow Particles Suspended in Near  
Sonic and Supersonic Free Jets

DESCRIPTIVE NOTE: Final rept. 23 Jul 75-15 Dec 70.

OCT 77 21P  
PERSONAL AUTHORS Martone, Joseph A ; Daley, Peter F. ;  
Boubel, Richard W. .

REPORT NO. CEEDO-TR-48

PROJECT NO. 1800

TASK NO. 2A

UNCLASSIFIED REPORT

Availability: Microfilm copies only

ABSTRACT: (U) This investigation was concerned with sampling subsonic flow particles in parisonic flows. Aerosol particles having a mean diameter of 0.8 micrometers and a geometric standard deviation of 1.28 were accelerated to Mach 0.6, 0.8, 1.28, or 1.47 through a flow nozzle. Aerosol mass concentrations were determined using a small bore probe in the jet and by a large bore probe sampling isokinetically upstream of the jet. The results of both samplings were compared to the sampling error associated with the high speed jet sample. Studies at Mach 0.8 with four sampling probes having inlet wall to bore area ratios ranging from 3.6 to 0.28 (a knife edge) demonstrated that probe wall thickness effects are not significant when the sample is extracted isokinetically. Subsonic flow particles using the knife edged probe showed relative errors of 124 + or - 17 percent when sampling at 20 percent of the isokinetic condition. The subsonic flow results are compared favorably with the experimental results of other authors. For the supersonic cases it is shown that the subsonic velocity distribution of the sampling probe bow shock can be used in estimating the sampling error (Author)

SCRIPTURES: (U) \*Aerosols, \*Sampling, \*Jet engine

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 058028

AD-A048 802 CONTINUED

Corporation (CDC) FORTRAN Extended, Version 4, and can be used on CDC 6000/7000 series computers without major modifications. This volume is the reference manual for BLAST and contains descriptions of all BLAST subprograms, as well as structural algorithm charts where appropriate.

DESCRIPTORS: (U) \*Energy management, \*Buildings, \*Computer programming, \*Programming manuals, Subroutines, \*Flow charting, Algorithms, Centralized, Heating plants, Air conditioning equipment, Ventilation, Thermal, Thermal systems, Meteorological data, Energy consumption, Thermal systems, High level languages, Computer program documentation

IDENTIFIERS: (U) NUCEED021020103, AST41, PE62731A, PE837237, WJ012, WJ021

AD-A048 884 1/8 13/2 8/1

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN ILL

(U) Development of a Pavement Maintenance Management System Volume 1, Airfield Pavement Condition Rating

DESCRIPTIVE NOTE: Final rept Jul 74 Jul 76.

DEC 77 232P

PERSONAL AUTHRS: Shahin, Mohamed Y ,Dartor, Michael I , Kohn, Starr D ;

REPORT NO CERL-TR-C-76-VOL-1

CONTRACT NO. MPR-FQ853-76-68005

MONITOR CECUO TR-77 44-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. Superseeds rept no. AFCEC-TR-76-27, AD-A041 401 See also Volume 2, AD-A049 029

ABSTRACT (U) This report describes the development and verification of a pavement condition index (PCI) for rating the condition of jointed concrete and asphalt or surfaced airfield pavements. The PCI, which measures airfield pavement structural integrity and surface operation conditions, is calculated based on measured pavement distress types, severity levels, and condition obtained during an inspection of the pavement. Volume 1 of this report presents distress types descriptions, severity levels, and measurement criteria for use in performing the pavement inspections

DESCRIPTORS: (U) \*Pavements, \*Runways, \*Maintenance management, Concrete, Asphalt, Surveys, Classification, Ratings, Deformation, Inspection, Maintenance, Repair, Cracking(Fracturing)

AD-A048 882

AD A048 884

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 05028

AD-A047 810 CONTINUED

WIAFCEC21042B17, PB63723F

AD-A047 010 1/5 13/2

APPLIED ENGINEERING RESOURCES INC SANTA BARBARA CALIF  
(U) Bomb Damage Repair (BDR) Damaged Pavement Removal and  
Crater Backfill Equipment Study

DESCRIPTIVE NOTIS. Final rept Feb 78-Dec 76.

DEC 76 180P

PERSONAL AUTHORS: Concha, Edward; Erickson, Glen.

CONTRACT NO F28801-78-C-0082

PROJECT NO 2104

TASK NO. 20

MONITOR: AFCEC  
1R-78-18

UNCLASSIFIED REPORT

**ABSTRACT** (U) Airfield bombing is a conventional denial tactic that an enemy may easily employ with great effectiveness; thereby reducing or eliminating the capability of repair or replacement by air strike. Rapid Bomb Damage Repair (RBD) is a technology necessary to restore airfields sufficiently to launch and recover tactical aircraft. The objective of this contract was to improve the current procedures and equipment utilized by optimizing the results of previous RDR research. The study determined that with modification to the existing equipment and changes in removal of upheaval and backfill procedures that with modification to the existing equipment and changes in removal of upheaval and backfill procedures that a 2-hour repair time is possible. In order to realize the 2-hour repair time, the procedures outlined in AFR 93-2 for repairing 750- and 1000-pound bomb craters require modification with a section added to address the repair of craters generated by 20-pound daylight detonation weapons. (Author)

**DESCRIPTORS** (U) bomb damage, repair, landing fields, weapons effects, damage, predictions, craters, filling, pavements, removal, equipment, modification, construction equipment, cost analysis

**IDENTIFIERS** (U) 750-LB BOMBS, 1000-LB BOMBS.

AD-A047 810

AD-A047 019

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055250

AD-A047 298 13/2 1/5 9/2

ARMORNE NATIONAL LAB ILI

(U) Air Quality Assessment for Air Force Operations - Long-Term Emission/Dispersion Computer Code Documentation

DESCRIPTIVE NOTE: Final rept 1 Jul 75-1 Jan 77.

APR 77 35P

PERSONAL AUTHORS: Bingham, Dorothy J.

PROJECT NO 1800

TASK NO 8A

MONITOR: CEEDO  
TR-78-35

UNCLASSIFIED REPORT

ABSTRACT. (U) The Air Force contracted with Argonne National Laboratory to develop a series of computer programs designed to assess the air quality impact of force operations at the airbase level. This report serves as a computer code documentation manual for the long-term emission/dispersion model of that effort. Descriptions of the computer codes corresponding to both the original version called the Research Model and the modified version called the Applications Model of the Long-Term Model are included. The manual contains flow charts, code listings, and brief descriptions of each routine contained in the model. It is intended primarily for readers with a computer programming background who wish to examine or alter the computer codes.

DESCRIPTORS: (U) Air quality, Air Force facilities, Programming manuals, Air pollution, Airports, Aircraft exhaust, Computer programs, Computers, Computerized simulation, Emission, Dispersion, Assessment, Flow charting, Subroutines.

IDENTIFIERS: (U) PB2801A, WUP076003

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CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) Evaluation of a New Trickling Filter Media

DESCRIPTIVE NOTE: Final rept Mar-May 76.

JUL 77 34P

PERSONAL AUTHORS: Allen, Dale H.

REPORT NO CEEDO TR-77 23

PROJECT NO 210J

TASK NO 7M

UNCLASSIFIED REPORT

ABSTRACT. (U) An evaluation to determine the effectiveness and loading parameters of a fused silica synthetic media filter known under the trade name of Gary Grit was conducted at the 15-inch pilot scale trickling filter plant at the Albuquerque Sequoia Treatment Plant using clarified secondary effluent. A laboratory scale trickling filter was installed using and synthetic sewage, primary filtered sewage, and Albuquerque sewage. Results from the pilot scale filter indicate low removal efficiency. Laboratory scale filter tests indicate low efficiency using an effluent from another laboratory scale trickling filter. The laboratory scale filter achieved in excess of 80 percent Chemical Oxygen Demand (COD) removal using a sugar and milk solids synthetic sewage. The laboratory scale filter reduced COD of Albuquerque secondary sewage by 60-75 percent. There is no evidence to indicate that this synthetic media achieved better results than any other media for use in trickling filters. (Author)

DESCRIPTORS: (U) Filters, Fused silica, Sewage treatment, Synthetic materials, Pilot studies, Waste treatment, Effluents, Sequoia treatment, Laboratory tests, Removal, Porous materials, Surface chemistry, Adsorption, Biodegradation, Microorganisms.

IDENTIFIERS: (U) Trickling filters, Gary glas, PB87223F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
AD-A047 181 CONTINUED

AD-A047 181 13/2

PURDUE RESEARCH FOUNDATION LAFAYETTE IN

(U) Noncontact Nondestructive Determination of Pavement Deflection under Moving Loads.

DESCRIPTIVE NOTE. Final rept Dec 74-Dec 76.

AUG 77 327P

PERSONAL AUTHORS: Harr, M. E.; Ng-A-Qui, N. T.;

CONTRACT NO. DOT-FA73WAI-381, F29801-75-C-0037

MONITOR: FAA-RD CEEDO  
77-127, IR-77-56

UNCLASSIFIED REPORT

ABSTRACT: (U) This report presents a procedure for nondestructively evaluating and predicting the deflection response of various flexible pavements to loads imposed by different aircraft. Transfer function theory is used to form the basis of a pavement evaluation and response scheme. Two mobile systems were developed for the measurement of pavement deflections: the Light Emitting Diode (LED) system and the Linear Variable Differential Transformer (LVDT) system. The report concludes that the rapid nondestructive measurement of pavement deflections due to moving prototype loads is feasible and that a total nondestructive evaluation scheme based entirely on the use of prototype loads and measured deflections can be fabricated to evaluate and predict instantaneous responses and cumulative effects of loads of various magnitudes and configurations (Author)

DESCRIPTORS: (U) Runways, pavements, Nondestructive testing, Deflection, Loads(Forces), Light emitting diodes, Load distribution, Transfer functions, Aircraft landings, Mathematical models, Dynamic response, Recording systems, Test methods, Test equipment, Landing impact, Motion

IDENTIFIERS: (U) C-130 aircraft, C-131 aircraft, C-130 aircraft, F-4 aircraft, Transfer function theory, Linear variable differential transformers

IAC NO. NT-015576

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

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AD-A047 004

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AD A047 004

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CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
THRELL AIR PL RETAINMENT (AUTC)(U) Membrane Encapsulated Soil Layer (MSEL) for  
Contingency airfieldsDESCRIPTORS: (U) Landing fields, Soil stabilization,  
Encapsulation, Army aviation, Airfield construction,  
Climate, Moisture control, Polyethylene plastics,  
Polypropylene, Jet fighters, Synthetic materials, GrassesIDENTIFIERS: (U) Contingency airfields, Membrane  
encapsulated soil layer, F-4C aircraft, WCEEDG20544817,  
PEG4708F

DESCRIPTIVE NOTE: Final rept May 78-Feb 77.

APR 77 84P

PERSONAL AUTHORS: Rone, C L, Sullivan, A L, III.

REPORT NO CEEDO-TR-77-31

PROJECT NO. 2054

TASK NO. 4M

UNCLASSIFIED REPORT

ABSTRACT. (U) This study was conducted to evaluate thickness requirements for membrane encapsulated soil layers (MSEL) having various surfacing materials when subjected to 100 passes of F-4C aircraft loading and to determine the feasibility of constructing thin layers (5 to 9 inches) of MSEL on low strength subgrade. A test section consisting of five items was constructed and trafficked. All five items were constructed on a prepared subgrade having a rated California Bearing Ratio (CBR) of 7. Thicknesses of MSEL base courses were 5, 6, 7, 9, and 9 inches for items 1 through 5, respectively. Surfacing materials consisted of (1) asphaltic concrete on item 1, (2) 2 inches of asphaltic concrete on item 2, (3) synthetic turf on item 4A, and a 1-1/2-inch-thick sod on item 5. The significant findings of this study are that (1) thin MSEL base courses can be constructed over a CBR subgrade, (2) a MSEL with only the waterproof surface will structurally withstand 10 coverages of F-4C traffic but may be rendered susceptible to water due to wrinkling of the waterproof surfacing under traffic, (3) a MSEL is susceptible to infiltration of water when overlaid with a layer of wet material such as sod, and (4) a MSEL base course 7 inches thick with a 2-inch surfacing of asphalt concrete constructed on a 7 CBR subgrade will withstand 14 coverages (approximately 140 passes) of F-4C traffic. (Author)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

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AD-A046 807 13/2 5/1

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADFC)(U) Civil and Environmental Engineering Development Office  
Fiscal Year 1979 Technical Objectives Document

NOV 77 27P

REPORT NO. CEEDO-TR-77-49

UNCLASSIFIED REPORT

ABSTRACT: (U) This TOD describes the four Technical Planning Objectives developed to guide the conduct of research and development in passive defense techniques for the theater aircraft. Phase I studies, environmental pollution abatement and control, air mobility concepts, energy conservation, fire fighting equipment, air base support, and warm fog dispersal (Author)

DESCRIPTORS: (U) \*Civil engineering, \*Planning, \*Environmental engineering, \*Environmental protection, \*Fire protection, \*Firefighting vehicles, \*Energy conservation, \*Research management, \*Pollution abatement, \*Fog dispersal, \*Airports, \*Corrosion inhibition

IDENTIFIERS (U) PE54708F, PE6J723F, PE82601F

IAC NO PL-000428

IAC DOCUMENT TYPE: PLASTIC - HARD COPY --

IAC SUBJECT TERMS: P--(U)Energy conservation, Management programs, Review, R and D, \*Environment control, \*Corrosion resistance, \*Fog resistance, \*Shelters, \*Fame, \*Military applications, Launch pads, \*Paving, ZZ WTDE, ZZ Uninitiated

ARGONNE NATIONAL LAB ILL

(U) Air Quality Assessment Model for Air Force Operations - Short-Term Emission/Dispersion Computer Code Documentation

DESCRIPTIVE NOTE: Final rept 1 Jul 75-1 Jan 77.

APR 77 208P

PERSONAL AUTHORS: Bingham, Dorothy J ;

PROJECT NO 1900

TASK NO 5A

MONITOR. CEEDO

TR-78-34

UNCLASSIFIED REPORT

ABSTRACT. (U) The Air Force contracted with Argonne National Laboratory to develop a series of computer programs called the Air Quality Assessment Model (AQAM) designed to handle complex emission sources with emphasis on aircraft. A short term emission/dispersion model for hourly air quality predictions and a long term emission/dispersion model for monthly and annual predictions are also in AQAM. This report documents only the short term model. Flow charts, computer listings, and brief descriptions of each subroutine are included. They are intended for readers with a computer background who wish to examine or alter the computer code (Author)

DESCRIPTORS (U) \*Air quality, \*Air Force facilities, \*Terminal flight facilities, \*Computerized simulation, \*Air pollution, \*Aircraft exhaust, \*Short range time, \*Pollutants, \*Emission, \*Dispersions, \*Machine coding, \*Computer programs, \*Subroutines, \*Flow charting, \*Assessment

IDENTIFIERS (U) LPN-CEEDO-78-0003, WUCCEED019005A03, PE82601F

AD-A046 807

AD A046 348

UNCLASSIFIED

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## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A048 341 1/8 20/11

NEW MEXICO UNIV ALBUQUERQUE ERIC H MANG CIVIL  
ENGINEERING RESEARCH FACILITY(U) Evaluation of an Impulse Testing Technique for  
Nondestructive Testing of PavementsDESCRIPTIVE NOTE. Final technical rept 18 Oct 78-18 Jul  
77.

SEP 77 32P

PERSONAL AUTHORS: Nielsen, John P ; Baird, Glenn T .

REPORT NO CERF-AF-28

CONTRACT NO. F29601-76-C-0019

MONITOR: CEED0  
TR-77-46

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report documents the results of a study concerned with the evaluation of a proposed technique to perform nondestructive load evaluations of airfield pavements. This technique consists of determining the speed of propagation of the phase velocities through the various layers of a pavement system. A research plan to further develop the technique is also recommended. This plan contains statements of work, equipment recommendations, a proposed budget, and a schedule. (Author)

DESCRIPTORS: (U) \*Runways, \*Impulse loading, Wave propagation, Accelerometers, Concrete, Asphalt, Pavements, Elastic properties, Field tests, Data reduction, Equipment transformation, Vans, Air transportation equipment, Vibrators (Mechanical), Structural response

AD-A040 341

UNCLASSIFIED

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AD-A048 229 13/2 9/2 1/3 15/7

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)(U) Air Quality Assessment Model for Air Force Operations -  
- Source Emissions Inventory Computer Code  
Documentation

DESCRIPTIVE NOTE. Final rept. 1 Jul 75-1 Jan 77.

APR 77 185P

PERSONAL AUTHORS: Bingsaman, Dorothy J ; Mangen, Lawrence E .

REPORT NO CEED0-TR-78-33

PROJECT NO 1900

TASK NO. 9A

## UNCLASSIFIED REPORT

ABSTRACT (U) The Air Force contracted with Argonne National Laboratory to develop a series of computer programs to assess the air quality impact of Air Force operations. These programs included the Air Quality Assessment Model (AQAM). The AQAM contains three computer codes: A source emission inventory to quantify the hundreds of sources typically found on an airbase; a short term emission/dispersion model to make hourly air quality predictions; and a long term emission/dispersion model to make monthly or annual predictions. This report documents only the source emissions inventory computer code. While aircraft are emphasized, ground vehicles, space heating, and industrial sources can also be handled. Flow charts, listings, and brief descriptions of each subroutine are presented in this report. It is intended for readers with a computer programming background who wish to examine or alter the computer codes (Author)

DESCRIPTORS: (U) \*Air pollution, \*Air Force operations, \*Aircraft, \*Computer programs, Assessment, Emission control, Machine coding

IDENTIFIERS (U) AQAM (Air Quality Assessment Model),  
Quality Assessment Model, NUCEED019005A03, PE6201F

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DYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A045 607 CONTINUED

AD-A045 607 13/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TINDALL AFB FL DETACHMENT 1 (ADTC)

(U) A Theory on Water Filtration Part II Model  
Presentation

DESCRIPTIVE NOTE Final rept 1 Jun 73-31 Dec 78.

JUN 77 25P

PERSONAL AUTHORS Shelton, Stephen P .

REPORT NO CEEDO-TR-77-2

PROJECT NO 2103

TASK NO. 8W

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Part 3, AD-A043 280

ABSTRACT. (U) The specific objective of this investigation was to apply existing theoretical concepts used in aerosol mechanics to various water filtration systems. Once developed, these equations were used to describe the water filtration processes of concern as a function of the characteristics of the fluid, suspended particles, and filter media. It was concluded that the proposed model had the potential to predict the relationship between flow, pressure, time, and efficiency for the data evaluated. In addition, the model was found to have advantages over current water filtration models since unlike current models, it considers raw water quality and predicts filtration efficiency (Author)

DESCRIPTORS: (U) Water treatment, Filtration, Water filters, Environmental engineering, Mathematical models, Mathematical prediction, Aerosols, Diffusion, Mass transfer, Pressure gradients, Drops, Water flow, Flux(Rate), Water quality, Efficiency, Facilities, Sand, Particle size

IDENTIFIERS (U) PB83723F, NWAFC21038M45

IAC NO PL-901135

IAC DOCUMENT TYPE PLASTIC - MICROFILM

AD-A045 607

AD-A045 607

UNCLASSIFIED

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A045 484 13/2 21/2 1/3

AD-A045 483 13/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNALL AFB FL DETACHMENT 1 (ADIC)CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNALL AFB FL DETACHMENT 1 (ADIC)

(U) Air Quality Impact of Aircraft at 10 USAF Bases

(U) Water Quality Assessment Model - Oxygen Dynamics Model  
for Low-Flow Streams

DESCRIPTIVE NOTE: Final rept 25 Sep 76-15 Mar 77.

DESCRIPTIVE NOTE: Final rept 1 Jul 75-1 Mar 77.

APR 77 17P

MAR 77 32P

PERSONAL AUTHORS: Naugle, Dennis F ; Gress, Bradford C ;  
J.L. Daley, Peter S

PERSONAL AUTHORS Shelton, Stephen P

REPORT NO. CEEDO-TR-76-23

REPORT NO CEEDO-TR-77-15

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) The contributions of Air Force aircraft to ambient air quality at 10 major bases were predicted from operational data using a computerized Gaussian dispersion technique. Annual arithmetic mean concentrations are presented for common air pollutants. The predictions are well below National Ambient Air Quality Standards for these pollutants with confidence intervals. Aircraft emissions were predicted using a computerized Gaussian dispersion model. Pollutant Standards Index (PSI) values for aircraft sources produced average PSI values of 4.3 for nitrogen dioxide, 2.1 carbon monoxide, 1.9 for total suspended particulates, and 1.4 for sulfur dioxide. The PSI scale ranges from 0 to 500 with 100 designated as the level above which health effects may occur. A PSI for hydrocarbons could not be computed since direct health effects have not been observed and indirect effects through oxidant formation could not be predicted within the scope of this analysis. The relative significance of pollutants emitted by AF aircraft indicated by this report is (from most significant to least significant): hydrocarbons, oxides, or nitrogen, particulate matter, carbon monoxide, and sulfur oxides. This ordering can be used as a guide to future engine design priorities and control strategy development.

DESCRIPTORS: (U) \*Air quality, \*Aircraft engines, \*Exhaust gases, Emission, Air pollution, Turbojet engines, Computerized simulation, Air force facilities, Meteorological data, Standard, Environmental protection, Mathematical prediction, Dispersing, Pollutants

AD-A045 484

AD A045 483

## UNCLASSIFIED

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## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A045 483 CONTINUED

DESCRIPTORS (U) \*Water quality, \*Streams, Mathematics, models, Biochemical oxygen demand, Water flow, Low level, Air Force facilities, Environmental protection, Waste water, Water pollution, Oxygen, Dissolving

IDENTIFIERS (U) LPN-ADTC-15005W27

13/11 12/1

AD-A045 387 13/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
RYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) A Theory on Water Filtration Part I Background

DESCRIPTIVE NOTE Final rept 1 Jun 73-31 Dec 78.

JAN 77

42P

PERSONAL AUTHORS Shelton, Stephen P

REPORT NO CEEDO-TR-17-1

PROJECT NO 2103

TASK NO 6W

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Part 3, AD-A043 280

ABSTRACT (U) The specific objective of this investigation was to apply existing theoretical concepts used in aerosol mechanics to various water filtration systems. Once developed, these equations were used to describe the water filtration processes of concern as a function of the characteristics of the fluid, suspended particles, and filter media. It was concluded that the proposed model had the potential to predict the relationship between filter, pressure, time, and efficiency for the data evaluated. In addition, the model was found to have advantages over current water filtration models used. Unlike current models, it considers raw water quality and predicts filtration efficiency (Author)

DESCRIPTORS (U) \*Water filters, \*Filtration, \*Mathematical models, Concept formation, Experimental design, Aerosols, Fluid mechanics, Media, Particle size, Colloids, Flow rate, Pressure, Air filters, Water pollution abatement, Environmental engineering, Mass transfer, Diffusion theory

IDENTIFIERS (U) PB8723F, MICEED002103M45

IAC NO PL-901153

IAC DOCUMENT TYPE PLASTIC - MICROFICHE --

AD-A045 387

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AD-A045 483

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A045 387 CONTINUED

AD-A045 045 13/2

IAC SUBJECT TERMS: P - (U) Particle size effects, Theory, Filtration, Modeling, Waste water, Mass transfer, Constitutive relations, Diffusion properties, Flow properties, Pressure drop, 22 MTDP, 22 Unlimited,

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
THOMAS AFB FL DETACHMENT 1 (ADTC)

(U) An investigation of the Effects of Density, Size and Shape upon the Air Classification of Municipal Type Solid Waste

DESCRIPTIVE NOTE: Final Rep?

JUN 77 1675

PERSONAL AUTIPAS Sweeney, Patrick J.

REPORT NO CEED-TR-77-25

PROJECT NO 2103

TASK NO 01

UNCLASSIFIED REPORT

ABSTRACT (U) The objective of this research was to determine the feasibility of separating municipal waste type materials into more than two fractions by passing the material through a vertical air classifier. This feasibility was demonstrated by suspending specimens of varying densities, sizes, and shapes in a vertical air classifier and noting the terminal velocities of the materials. Since most shredded solid waste approximates flat plates of varying sizes and shapes, flat plates of six different materials in aspect ratios (length over width) from one to four and in four different sizes from 0.0025 to 1.000 square inches (0.4032 to 8.4516 square centimeters) were evaluated to determine terminal velocity. The materials studied included steel, aluminum, balsa wood, cardboard, paper, cloth, and glass. The theoretical development, the experimental results, and the analysis of variance statistical tests indicate that municipal solid waste type material does exhibit a difference in terminal velocity as a function mostly of density and only slightly of size and shape. The parameters tested. This indicates that municipal solid waste may be separable into several fractions provided the proper air classification equipment is used (Author)

DESCRIPTORS (U) \*Solid wastes, \*Waste management, \*Waste recycling, Urban areas, Air, Separation, Density, Sizes (Dimensions), Shape, Classification, Resources,

AD-A045 387

AD-A045 045

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO J58028

AD-A045 045 CONTINUED

Recovery, Steel, Aluminum, Wood, Paper, Paperboard, Glass, Fabrics, Shredding, Volatility

AD-A045 042 13/1

FRANK J SEILER RESEARCH LAB UNITED STATES AIR FORCE ACADEMY COLO

IDENTIFIERS: (U) Air classification systems, PE63723F, YUNFCEZ1036N82, LPT-AFIC-77-058

(U) Second Interim Technical Report on USAFA Solar Test House

DESCRIPTIVE NOTE Rept. for May 78-Apr 77,

SEP 77 185P

PERSONAL AUTHORS: Eden, Anthony ; Tinsley, John T. ;

REPORT NO FJSRL-TR-77-0018

PROJECT NO 2303, 2054

TASK NO F1, 50

MONITOR CEEDU TR-77-34

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates. All DDC reproductions will be in black and white. See also Rept no FJSRL-TR-78-0008, AD-A030 843

ABSTRACT. (U) This report describes the continuing performance of the first retrofit-constructed, solar-heated facility in the USAF, the Solar Test House at the USAFA. The attempts at improving the performance of the system have centered on the following: additional heat exchangers, bleed air line and valves, ground array angle changes, reduced volume of storage tank, continuous data gathering system. The Solar Test House was designed to conserve thermal energy by using urea foam insulation in the ceilings, vestibules on the doors, and linear diffusers for the duct outlets. Thermography studies have been started to explore the flow patterns through the solar arrays and correlate pictures with multiplexed sensor readings. Daily, monthly, and yearly data analysis is reported to show the effects of the various system and operational changes and the improved performance. (Author)

DESCRIPTORS (U) Solar heating, Housing(Dwellings), Air Force facilities, Solar panels, Retrofitting, Solar

AD A045 042

UNCLASSIFIED PAGE 4 4 055028

AD-A045 045

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A045 042 CONTINUED

AD-A043 268 13/2 13/8

energy, Energy conservation, Thermography, Performance engineering, Heat exchangers, Bleed systems, Arrays, Storage tanks, Flow rate, Thermal insulation

IDENTIFIERS: (U) WUJUSRL2303176, PEB1102F, WUJUSRL23545003, PEG4708F

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FLA DETACHMENT 1 (ADTC)

(U) Pollutant Generation by Air Force Electroplating Processes

DESCRIPTIVE NOTE: Final rept 1 Oct 74-1 Sep 76.

JUN 77 37P

PERSONAL AUTHORS: Daley, Peter S. ;

REPORT NO CEEDO-TR-77-10

PROJECT NO 2103

TASK NO 1A

## UNCLASSIFIED REPORT

ABSTRACT. (U) A detailed study of the pollutants generated in Air Force electroplating was performed and pollution emission factors were recommended for a variety of electroplating operations. The largest single source of pollution in the plating operation was 'dragout', the material removed by parts when they are withdrawn from solution and rinsed for chromium plating, aerosol separation at the plating solution surface was significant, amounting to 0.12 g/A da. This number was independent of wide variety of electroplating variables and is recommended as an emission factor in chromium electroplating. Aerosol generation is not important in nickel, cadmium, or silver plating procedures. Cyanide emissions in cadmium plating were independent of load and depended primarily on tank surface area. An emission factor of 10 g/sq m da is recommended. Collateral studies of scrubber efficiency for scrubber collection of chromium aerosols, quantitation of the dragout problem, and potential savings through chromium overplate recovery are presented. Chromium is identified as the major pollution problem resulting from electroplating. Logic is presented that could lead to the exemption of Air Force electroplating operations from federal electroplating emission standards. (Author)

DESCRIPTORS (U) \*Electroplating, \*Air Pollution, \*Water Pollution, \*Chromium, \*Nickel, \*Silver, \*Cadmium, \*Cyanides, Aerosols, Scrubbers, Effluents

AD-A043 268

## UNCLASSIFIED

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AD-A045 042

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A043 208 CONTINUUM

AD-A043 081 13/2 13/7 20/4

IDENTIFIERS: (U) PB03773F, WUAFCE2:031A15

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TUNDAI AFB FLA DETACHMENT 1 (ADTC)(U) A New Concept in Sludge Filtration Theory for Air  
Force Industrial Processes

DESCRIPTIVE NOTE: Final rept 1 Jan-30 Jan 74.

JUN 77 17P

PERSONAL AUTHORS Shel'vn, Stephen P .

REPORT NO GEED0-TR-77-29

PROJECT NO 2103

UNCLASSIFIED REPORT

Availability Microfiche copies only

ABSTRACT. (U) The specific objective of this investigation was to apply existing theoretical concepts used in air filtration to various sludge filtration systems used in Air Force industrial processes. This objective involved development of a consistent theoretical concept applicable to a wide range of filtration systems. Once developed, these equations were used to describe the sludge filtration process of concern to the Air Force as a function of the basic system parameters rather than using the classical empirical data base (Author)

DESCRIPTORS (U) \*Sludge, \*Filtration, Air Force facilities, Industrial engineering, Theory, Vacuum apparatus, Air filters, Water treatment, Water filters, Aerosols, Filters, Waste disposal, Water, Removal, Dry materials, Moisture content, Particles, Concentration(Chemistry), Mathematical models

IDENTIFIERS (U) \*Vacuum filtration, Dewatering, Suspended particles, LFN-ADTC-21030W45, PB03723F

AD-A043 208

AD-A043 081

UNCLASSIFIED

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A042 003

13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Pavement Evaluation System

DESCRIPTIVE NOTE: Final rept. 1 Dec 78-30 Sep 78.

OCT 78 108P

PERSONAL AUTHORS: Nielson, John P. (Jaird, Glenn T.)

REPORT NO CERF-A-20

CONTRACT NO. F29801-78-C-0015

MONITOR: AFCEC

TR-78-28

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the current (1978) Air Force method for load evaluation of airfield pavements. The technique makes use of wave-propagation data and finite-element computer codes to determine the load capacity of pavements. The computer code also provides an estimate of the remaining service life of the pavement from failure criteria for the various layers of the pavement. (Author)

DESCRIPTORS: (U) pavements, standing fields, loads (forces), life expectancy, nondestructive testing, testing, finite element analysis, safety, stress, stress-strain relations, models, shear stresses, shear strength, mechanical properties, structural properties, test methods

TAC NO NT-015028

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

IAC SUBJECT TERMS: N--(U)PAVEMENTS, AIRPORTS, LOADS (FORCES), LIFE (DURABILITY), WAVE PROPAGATION, ELEMENT ANALYSIS, SAFETY, STRESS STRAIN RELATIONS, STRESSES, FAILURE CRITERIA, TEST METHODS, STRUCTURAL ANALYSIS, STRUCTURES, PROPERTIES, STRENGTH (MECHANICS).

AD-A043 003

AD-A042 628

UNCLASSIFIED

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AD-A042 028 13/3 14/1  
CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN  
ILL

(U) Corrosion Costs of Air Force and Army Facilities and  
Construction of a Cost Prediction Model

DESCRIPTIVE NOTE: Final rept 1 Jul 78-30 Oct 78.

JUL 77 71P

PERSONAL AUTHORS: Hahin, Christopher;

REPORT NO CERL-TR-M-224

PROJECT NO 4A762719AT41

TASK NO T7

MONITOR: AFCEC

TR-77-17

UNCLASSIFIED REPORT

ABSTRACT: (U) The facility maintenance organizations of several Air Force and Army facilities are being analyzed to determine the percentage of their direct maintenance activities that are devoted to corrosion-related efforts that were corrosion-related. Activities included were the costs of designing and inspecting corrosion-related construction projects. This raw data was processed and correlated with climatological, geographic and environmental statistics to develop a predictive corrosion cost model. The resulting empirical equations are able to predict facility corrosion costs and classification with reasonable accuracy as a function of installation dimensions and capacities, and readily obtainable weather, soil and air quality data. (Author)

DESCRIPTORS: (U) \*Construction materials, \*Corrosion, \*Cost analysis, Mathematical models, Air Force facilities, Army, Military facilities, Soils, Costs, Construction, Electrical conductivity, Air pollution, Energy consumption, Climate, Topography, Prediction, Water pollution

IDENTIFIERS (U) WU001, AS741, PE82719A

## UNCLASSIFIED

D/IC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A042 823 CONTINUED

International airports, District of Columbia, Computer programs, Equations of motion, Weight, Programming manuals, User needs, FORTRAN, Tables(Data), Computer printouts

IDENTIFIERS (U) TAXI computer program

AD-A042 823 1/5 1/3 1/2  
AIR FORCE CIVIL ENGINEERING CENTER TINDALL AFB FLA  
(U) Collection of Commercial Aircraft Characteristics for  
Study of Runway Roughness

DESCRIPTIVE NOTE: Final report.

MAY 77 130P

PERSONAL AUTHORS Gerardi, Anthony G.

REPORT NO AFCEC-YR-78-23

CONTRACT NO DDT-FA73MAY-J61

MONITOR. FAA-RD  
78-84

UNCLASSIFIED REPORT

553

Availability. Microfiche copies only

ABSTRACT (U) Engineering data compatible with 'TAXI' computer program was collected for six commercial jet aircraft: the Boeing 707-320C, 727-200, and 747 and the McDonnell Douglas DC-8-60, DC-9-40 and the DC-10-10. The data are presented in the form required for TAXI. A simulation was made for each aircraft taking off from two separate airfields, Dulles International in Washington, D C and Will Rogers International Airport at Oklahoma City, Oklahoma. Two profiles were used to point out the differences in aircraft response to different runway profiles. The calcomp plotted results are presented in the results section of this report. This report also contains a program users manual. A sample problem is included. The Boeing 707 320C during a constant speed taxi (100 ft/sec) over the profile at the Will Rogers International Airport is included in the report. All FORTRAN symbols used in TAXI are defined, and a complete listing of the program is included. An appendix provides airplane data representing a 'Typical' wide body tri-jet transport and two simulations using this data.

DESCRIPTORS (U) \*Runways, \*Pavements, \*Jet transport planes, Surface roughness, Profiles, Dynamic response, Computerized simulation, Commercial aircraft, Aircraft landings, Taxiing, Landing gear, Coupling (Interaction), Landing fields, Commercial aviation, Oklahoma, Virginia.

AD-A042 823

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A042 388

13/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FLA DETACHMENT 1 (ADIC)

(U) Chemical Coagulation Dosage Control

DESCRIPTIVE NOTE. Final rept 30 Jun 73-1 Jan 76.

DEC 73

27P

PERSONAL AUTHORS: Sholton, Stephen P. ;

REPORT NO. CEED0-TR-78-44

PROJECT NO. 2103

UNCLASSIFIED REPORT

**ABSTRACT** (U) The purpose of this investigation was to determine if the best dosage for various coagulants would be the same if a number of indicators were used as the best dosage criteria. Specifically, what is the indicated best coagulant dosage between zeta potential, colloidal titration, apparent color, true color, COD reduction, turbidity reduction, and bacteriophage reduction. Two types of water were used to empirically determine the above relationships. The first water was a secondary wastewater treatment plant effluent; the type of wastewater that may be delivered to an advanced wastewater treatment system. The other water was a relatively unpolluted raw surface water. The type of surface supply that is then investigated after testing supply the results of this investigation, after testing with numerous different coagulant/coagulant aid combinations, revealed that the best dosage varies as a function of the indicator used to determine that dosage.

**DESCRIPTORS:** (U) \*Water treatment, \*Coagulation, Effectiveness, Waste water, Test methods, Indicators, Colors, Turbidity, Chlorination, Dosage, Quality control, Contamination

**IDENTIFIERS:** (U) LPN-ADTC-21038645, PB83723F

AD-A042 388

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AD-A042 324

13/13

8/13

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Severely Eccentric Loads on Round Footings

DESCRIPTIVE NOTE. Final rept Sep-Oct 76.

JAN 77

18P

PERSONAL AUTHORS: Morrison, Dennis.

REPORT NO. AFCEC-TR-77-8

PROJECT NO. 2054

TASK NO. 50

UNCLASSIFIED REPORT

**ABSTRACT** (U) Design aids for sizing round footings with eccentric loads outside of the middle one-fourth are presented. Equations are developed and shown in graphical form by normalizing the load (Author)

**DESCRIPTORS:** (U) \*Foundations(Structures), \*Civil engineering, \*Soil mechanics, Loads(forces), Structural mechanics, Circular, Graphics, Computations, Force(mechanics), Pressure distribution

**IDENTIFIERS:** (U) Footings(Structures), Circular structures, Eccentric loads, Round footings, Stresses, WUAFCEC2C845007, PB84708F

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 085028

AD-A042 143 20/1 9/2

BOLT BERANEK AND NEWMAN INC CANOGA PARK CALIF

(U) Community Noise Exposure Resulting from Aircraft Operations NOISEMAP Computer Program Operation Manual Addendum for Version 3.3 of NOISEMAP

DESCRIPTIVE NOTE. Rept. for 22 Mar-28 Dec 78.

MAY 77 30P

PERSONAL AUTHORS. Reddingius, Nicolas H.

REPORT NO 8BN-3400

CONTRACT NO F08035-78-C-0186

PROJECT NO 7231

TASK NO. 04

MONITOR AMRL  
TR-73-108-App-Add-1

UNCLASSIFIED REPORT

Availability microfiche copies only

SUPPLEMENTARY NOTE. Addendum 1 to Appendix dated Feb 78.  
AD-A042 811 See also basic report dated Jul 74, AD-785 300

ABSTRACT (U) This report outlines modifications to NOISEMAP 3.2 and a user oriented description of a NOISEMAP data screening program called DATASCREEN. Changes to NOISEMAP include new identification options for the FLITRK, DEPART, and RHPAD cards; option to print only those pages from PREPLOT, ARPLOT, EMPLOT, or PRINT cards that contain parts of a contour; option to reduce the number of SEL alignment pages; option to suppress the listings of SEL profiles; interface with GPCP is no longer restricted to a grid spacing of 1000 feet or less, addition of the CLEAR keyword that will expunge all entries in the library. The new program, DATASCREEN, provides an improved summary, improved error diagnostics, and additional graphic outputs. A deck prepared for DATASCREEN will be accepted by NOISEMAP. The purpose of DATASCREEN is to provide the user with an efficient screening program to use in preparing a data deck for Ldn

AD-A042 143

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 085028

AD-A041 086 10/1 10/2  
 NATIONALS' BUREAU OF STANDARDS WASHINGTON D C  
 (U) An : ch for Managing an Energy Conservation  
 Prog  
 DESCRIPTIVE NOTE: Final rept Dec 75-Jan 77  
 JAN 77 50P  
 REPORT NO NBSIR-77-1204  
 MONITOR. AFCEC TR-77-11

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Rept. no NBSIR-77-1238,  
 AFCEC-TR-77-12

ABSTRACT: (U) General and specific guidelines to be followed by USAF management personnel have been developed and included in this report. These guidelines include, for example, establishing management structures to implement the detailed energy conservation programs, analyzing alternative energy conservation options for most of the Air Force Base facilities, family housing units, and special buildings. The guidelines are to be helpful for establishing and implementing short- and long-range plans for energy management, gaining support of all Base and tenant personnel, and monitoring program progress (Author)

DESCRIPTORS. (U) \*Energy conservation, \*Energy management, \*Energy consumption, Buildings, Facilities, Military facilities, Air force facilities, Surveys, Natural resources

AD-A041 086

UNCLASSIFIED

AD-A040 482 6/6 9/2

SAN DIEGO STATE UNIV CALIF CENTER FOR REGIONAL  
 ENVIRONMENTAL STUDIES  
 (U) Ecological Assessment of Vandenberg Air Force Base,  
 California Volume III Environmental Planning System  
 DESCRIPTIVE NOTE Final rept Jun 75-Aug 76.

SEP 76 107P  
 PERSONAL AUTHORS Reilly, Richard M , Stutz, Frederick P ;  
 Cooper, Charles F ;  
 CONTRACT NO. F29801-73-C-0116  
 PROJECT NO 2103  
 TASK NO 3E  
 MONITOR AFCEC TR-76-15-Vol-3

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE Master's thesis. See also Volume 2,  
 AD-A026 407

ABSTRACT. (U) This third volume of a three volume report contains a description and documentation of the computer-based Environmental Planning System (EPS) developed for Vandenberg Air Force Base (VAFB), California. The environmental inventory of VAFB provided the basic data, in computer-compatible form, for the EPS presented in this volume. The GRID computer graphics program and other computer programs used in the EPS are described. A detailed users manual is presented which describes the specific procedures for operating the computer programs with the computerized data base developed for VAFB. A complete description of the quantitative ecological data base upon which the EPS operates is provided. A series of case studies show how to apply the EPS to VAFB. An evaluation of manual and automated methods for determining areas of vegetation and land use presented using statistical tests to compare the various methods. Complete documentation is given for all computer programs used in the EPS (Author)

DESCRIPTORS (U) \*Ecology, \*Natural resources, \*Air

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A040 212 1/2

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
(U) A Review of Publications on the Bird/Aircraft Strike Hazard.

DESCRIPTIVE NOTE: Final rept Oct 78-20 Jun 78.

JUL 78 28P

PERSONAL AUTHORS Moorehead, Armin S. McCracken, Portia R

REPORT NO AFCEC-TR-78-21

PROJECT NO 2103

TASK NO 3E

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of this research effort was to evaluate Reverse Osmosis (RO) as a process to reduce pollution and increase materials conservation in large Air Force chrome plating operations. In these studies simulated chrome plating solutions were processed by an RO unit built to Air Force specifications by Envirex, Inc. Milwaukee, Wisconsin, using three types of commercial RO modules. In particular, this study was aimed at determining the degree of operation and membrane deterioration when RO is applied to hexavalent chromium in an acidic medium (pH 6.5). Initial tests were made on a tubular, spiral wound, and plate type membrane manufactured by Permapas to determine which type membrane might be applicable to the chrome plating process. Based on these initial studies, the Permapas membrane was chosen for further study. The Permapas membrane demonstrated a high salt rejection ratio (0.98 to 0.99 reject ratio) and a high process recovery rate (0.69 to 0.70 recovery ratio). A clean water system resulting in zero discharge of chromium from water emissions was designed based on the results of the Permapas membrane. (Author)

DESCRIPTORS (U) Reverse osmosis, Water pollution, Electropolluting, Pollution abatement, Membranes, Chromium, Waste treatment, Waste management, Waste recycling, Recycled materials

IDENTIFIERS: (U) Permapas membrane, WUAFCEC21037K37, PER3723F

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## DTIC REPORT BIBLIOGRAPHY

AD-A040 113 5/1 13/2

LITTLE (ANNUAL D) INC CAMBRIDGE MASS

(U) A Methodology for Preparing Environmental Assessments

DESCRIPTIVE NOTE Final rept Mar 78-Nov 78,

NOV 78 41P

PERSONAL AUTHORS Holstrom, David I ;

CONTRACT NO F38601-74-D 0017

PROJECT NO 2103

TASK NO 3E

MONITOR AFCEC

TR-76-8

UNCLASSIFIED REPORT

ABSTRACT: (U) This report provides instructions for Air Force field personnel in the methods for preparing Environmental Assessments. The report covers the following areas: (1) The necessity for Environmental Assessments, including a discussion of the applicable laws; (2) Instruction on how to describe the proposed action; (3) Guidance on how to evaluate the environment in light of the proposed action; (4) Instruction and guidance on approaches to be used when assessing impacts; (5) Establishing and maintaining an environmental baseline data information system. The report is written for a person with a technical background, but without do-it guidance for field personnel. It provides how-to responsibility of preparing Environmental Assessments.

DESCRIPTORS: (U) \*Environmental management \*Environmental protection, Air force planning, Resource management, Federal law, Environmental impact statements, Assessment, Water resources, Land use, Air quality, Water quality, Information systems

IDENTIFIERS (U) PB83723F, MUAFCEC21033E25

AD-A040 113

UNCLASSIFIED

## SEARCH CONTROL NO 035028

AD-A038 844 14/2 13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY(U) Development of High Pressure Liquid Chromatographic  
Techniques

DESCRIPTIVE NOTE Final rept 1 Dec 75-30 Jun 76,

OCT 76 68P

PERSONAL AUTHORS: Caton, Roy D . Jr., Matthews, James R .  
Walters, Edward A .

REPORT NO CERF-EE-10

CONTRACT NO F28801-76-C-0015

MONITOR AFCEC

TR-76-24

UNCLASSIFIED REPORT

ABSTRACT: (U) Development of high pressure liquid chromatography detectors is discussed. Preliminary evaluation of a beta-induced luminescence detector employing a tritium source and operated in a luminescence quenching mode is presented. An ultrasonic velocity detector is described, along with calibration data, complete construction details, and operating instructions. A solid-state electrode for silver ion detection using a AgCl/Ag pellet is described, and calibration data and interference studies are presented. Construction of a beta-induced luminescence detector to be operated in a direct luminescence mode is described. Data for the recovery and preliminary characterization of refractory compounds and treated wastewater using an organic carbon analyzer are presented. The detection limit of the analyzer of the minisampler is analyzed using high pressure liquid chromatography, and column parameters providing maximum resolution of components are given in detail. (Author)

DESCRIPTORS: (U) \*Detectors, \*Liquid chromatography, \*Water analysis, Waste water, Waste treatment, Refractory metals, Organic compounds, High pressure, Luminescence, Tritium, Activated carbon, Ultrasonics, Calibration, Solid state electronics, Electrodes, Silver compounds, Effluents

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AD-A039 229 13/2  
 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 085028  
 AD A038 731 13/13  
 AIR FORCE CIVIL ENGINEERING CENTER TYNDALE AFB FLA  
 (U) Treatment of N-Nitrosodimethylamine Contaminated Waste  
 With Activated Carbon.  
 DESCRIPTIVE NOTE Final rept Jan-Dec 75.  
 JUL 78 18P  
 PERSONAL AUTHORS MacNaughton, Michael G ; Stauffer, Thomas  
 B. ;  
 REPORT NO. AFCEC-TR-79-32  
 PROJECT NO. 2103  
 TASK NO. 7C  
 AIR FORCE CIVIL ENGINEERING CENTER TYNDALE AFB FLA  
 (U) Air Transportable Shelters. Estimating the 1985 USAF  
 Requirements.  
 DESCRIPTIVE NOTE Final rept Jan-Jun 78.  
 OCT 78 72P  
 PERSONAL AUTHORS Van Orman, James R .  
 REPORT NO AFCEC-TR-78-24  
 PROJECT NO 2101, 2002  
 UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Research on the activated carbon removal  
 of N-nitrosodimethylamine (NDMA) from caustic waste  
 solutions generated during the manufacture of NDMA  
 missile fuel is reported. Results indicate that activated  
 carbon will remove NDMA from the caustic solutions  
 without neutralization and then commercial activated  
 carbons all have approximately the same capacities.  
 Although this process is capable of reducing the NDMA  
 concentration in the waste solutions, disposal of the  
 contaminated carbon still remains a problem. (Author)  
 DESCRIPTORS: (U) \*Waste treatment, \*Activated carbon,  
 \*Nitrosamines, Liquid rocket propellants, Adsorption, pH  
 factor

IDENTIFIERS: (U) Unsymmetrical dimethyl hydrazine,  
 Nitrosodimethylamine, PB53723F, NDAFCEC21037C58

ABSTRACT: (U) Air transportable shelters are vital  
 elements in present USAF weapon systems, but Committee on  
 Technology (COT) in the Air Force Research Committee on  
 Tactical Shelters (ACOTAS) was established by DOD to  
 effect this standardization. This report summarizes the  
 USAF effort in this regard. Configuration requirements  
 are analyzed in four major areas: transportation,  
 natural environment, threat-imposed environment, and  
 special mission considerations.

DESCRIPTORS: (U) \*Portable shelters, Military  
 requirements, Air transportable equipment, Tactical  
 warfare, Mobility, Military equipment, Field conditions,  
 Adverse conditions

IDENTIFIERS (U) PB82204F, PB53723F

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AD-A038 731

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W/C REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A038 888 21/8 1 13/2 AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
(U) MOWA Treatability Studies

DESCRIPTIVE NOTE Final Rept 1 Jan-1 Cat 75.

DEC 76 13P

PERSONAL AUTHORS Shelton, Stephen P.

REPORT NO AFCEC-TR-76 43

PROJECT NO 2103

TASK NO 7C

UNCLASSIFIED REPORT

ABSTRACT (U) This investigation evaluated the feasibility of destruction of MOWA using the wet air oxidation process. From the limited data evaluated, it was determined that MOWA was amenable to destruction by wet air oxidation to approximately 10% residual concentration with an air-to-waste ratio of 1000:1. The research required to determine the operational conditions to achieve oxidation to these levels was beyond the scope of this investigation (Author)

DESCRIPTORS (U) \*Amino compounds, \*Waste recycling, \*Oxidation, Chemical derivatives, Dimethyl hydrazine, Liquid rocket fuels, Caustics, Wastes (Industrial), Carcinogens, Quantitative analysis, Sodium hydroxide, Nitrites, Feasibility studies, Sampling Waste treatment, Experimental data

IDENTIFIERS (U) \*MOWA (N-Nitrosodimethylamine), N-nitrosodimethylamine (MOWA), Dimethylhydrazine, Wet air oxidation process, MOWA (N-nitrosodimethyl dimethylhydrazine), AFCEC21037C55, PE03723F

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AD A038 848 1/5 8/13 18/4

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
(U) MOWA Treatability Studies

DESCRIPTIVE NOTE Final Rept 1 May Aug 76.

DEC 76 24P

PERSONAL AUTHORS Rollings, Raymond S.

REPORT NO AFCEC-TR-76-40

UNCLASSIFIED REPORT

ABSTRACT (U) Existing data were used to examine the types of soils and their thicknesses that can be used as a select fill base course with AM-2 in the existing airfield bomb damage repair procedures. Dense graded, cohesionless crushed aggregate is the preferred material for the select fill base course. Sand and naturally occurring soft grained soils are suitable alternatives. Thickness of the base course will vary from 12 to 24 inches depending on the back-fill soil type and moisture content (Author)

DESCRIPTORS (U) \*Landing mats, \*Cratering, \*Backfills, Bomb damage, Civil engineering, Piers, Soil mechanics, Repair, Thickness, Soil classification

IDENTIFIERS (U) Fill base, AM-2 landing mats, Aggregates, PE03723F

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## DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO C55028

AD-A037 894 21/5 13/2  
 AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
 (U) Prediction of Test Cell Visible Emissions  
 DESCRIPTIVE NOTE Final rept Jun-Nov 76.  
 DEC 76 41P  
 PERSONAL AUTHORS Finch, Samuel P. III; Evi, Arland W.  
 Jr.;  
 REPORT NO AFCEC-TR-76-47  
 PROJECT NO 2103  
 TASK NO 7A

UNCLASSIFIED REPORT

ABSTRACT: (U) A theoretical correlation between jet engine test cell plume opacity and Society of Automotive Engineers (SAE) engine smoke number (SN) was developed. Intermediate results provide soot loading at the exhaust plane of the engine, engine exhaust flow rates and test cell total air flow rate. The specific particle extinction coefficient which correlates light scattering properties with soot loading is the most difficult parameter to define. A value predicted from Mie theory is used for correlations close to the exhaust plane of the engine. At the exit plane of the exhaust stack agglomeration and scattering change the particle size distribution and individual particle density so that theoretical prediction is difficult. The value for specific particle extinction coefficient at the exhaust stack was chosen based on what little empirical data was available when additional data becomes available, it should be possible to define this parameter more precisely. (Author)

DESCRIPTORS: (U) Jet engine exhaust, Air pollution, Exhaust plumes, Environmental protection, Particulates, Soot, Automobile exhaust, Predictions, Smoke

IDENTIFIERS (U) WUAFCEC21037A29, PER3723F

AD-A037 894

AD-A037 892

UNCLASSIFIED

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UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes a methodology for optimizing solid waste management at Air Force installations. The methodology was originally developed by contract and applied to four Air Force bases. The purpose of this report is to provide a cogent and readily accessible source of guidance for Air Force base managers who need to reevaluate their solid waste management program because of increased cost and environmental pressures. (Author)

DESCRIPTORS: (U) Waste management, Solid wastes, Air Force facilities, Methodology, Waste disposal, Optimization, Cost effectiveness, Sanitary engineering, Systems analysis

IDENTIFIERS: (U) WUAFCEC21038V09, PER3723F

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

7/4

AD A037 478

13/2

7/4

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Evaluation of Activated Carbon for Fuel Oil Adsorption  
from a Potable Water Supply

DESCRIPTIVE NOTE Final rept Mar 75-May 76.

OCT 78 12P

PERSONAL AUTHORS Allen, Dale H.

REPORT NO AFCEC-TR-76-48

PROJECT NO 2103

TASK NO 7M

UNCLASSIFIED REPORT

ABSTRACT (U) Evaluation of activated carbon adsorption process to remove diesel fuel from a contaminated Air Force Water supply was accomplished Laboratory scale tests proved activated carbon highly capable of removing diesel fuel from water. Adsorption parameters were contact time and other parameters were unsuccessful because of extreme rapidity of adsorption by the activated carbon (Author)

DESCRIPTORS (U) Activated carbon, Adsorption, Diesel fuels, Potable water, Oil pollution, Decontamination, Water supplies

IDENTIFIERS (U) WUAFCEC21037457, PB83723F

AD A037 478

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AD A038 544

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SEARCH CONTROL NO 055028

AD A038 544 1/5 11/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Acoustic-Emission Characteristics of Plain Concrete

DESCRIPTIVE NOTE Final rept 1 Mar 75 30 Sep 76.

OCT 76 42P

PERSONAL AUTHORS Griffin, Donald F .Nielsen, John P .

REPORT NO CERF-AP-22

CONTRACT NO F29601-76-C-0018

PROJECT NO 2104

TASK NO 1A

MONITOR AFCEC

TR-76-30

UNCLASSIFIED REPORT

ABSTRACT (U) The results of acoustic-emission tests on young concrete specimens and concrete cores from airfield pavements indicate that the Kaiser Effect is not observed in concrete. That is, there is a recovery such that load cycles applied subsequent to the initial load cycle will produce acoustic-emission signals similar to those obtained during the first load cycle. This report suggests, therefore, that the Kaiser Effect cannot be used to detect the maximum past stress in concrete which has not been subjected to a continuous stress (Author)

DESCRIPTORS (U) Concrete, Runways, Curing, Acoustic measurement, Aging (Materials), Fatigue (Mechanics), Stresses, Recovery

IDENTIFIERS (U) Kaiser effect, PB83723F,  
WUAFCEC21041A14

## UNCLASSIFIED

AD-A070 587 9/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 035018  
AD-A030 390 12/1

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Development of Contouring Capability for Displaying  
Results of Air Quality Assessment Model

DESCRIPTIVE NOTE Final report 1 Jul 75-1 Jun 76.

QC 70 40P

PERSONAL AUTHORS: Murphy, Edward P.

REPORT NO CERF-EE-8

CONTRACT NO F28901-76-C-0015

PROJECT NO. 2103

TASK NO. 5A

MONITOR: AFOSR  
TR-76-25

## UNCLASSIFIED REPORT

ABSTRACT: (U) A computer contouring plot package has been developed to display the results of the Air Quality Assessment Model (AQAM). This program accepts input data cards or an input data tape generated on an AQAM run up to 20 unequal contour levels with tension parameters and dashline patterns may be specified in each contour plot. The contouring package is written for the CDC 8500 computer system. (Author)

DESCRIPTORS: (U) Air quality, Data displays, Contours, Assessment, Models, Computer graphics, Algorithms, Air pollution, Aircraft exhaust, Exhaust plumes, Airports

IDENTIFIERS: (U) NUAFCCE21039A23, PB07713F

AD-A030 397

## UNCLASSIFIED

AD-A030 390

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NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF BIOSTATISTICS  
(U) Asymptotically Distribution-Free Aligned Rank Order  
Tests for Composite Hypotheses for General  
Multivariate Linear Models.

76

17P

PERSONAL AUTHORS: Sen, Pranab Kumar; Puri, Madan L.;

CONTRACT NO AF AFOSR-2738-74

PROJECT NO 2304

TASK NO A5

MONITOR: AFOSR  
TR-77-0101

## UNCLASSIFIED REPORT

ABSTRACT: (U) For general multivariate linear models, a composite hypothesis does not usually induce invariance of the joint distribution under appropriate groups of transformations, so that genuinely distribution-free aligned rank order statistics are not available for this purpose. Some proposals for the construction of aligned rank order statistics are proposed and study of a class of asymptotically distribution-free tests is made for the parallelism of several multiple regression surfaces are also considered. Finally the optimal properties of these tests are discussed. (Author)

DESCRIPTORS: (U) Multivariate analysis, Rank order statistics, Statistical tests, Linearity, Mathematical models, Regression analysis, Hypotheses

IDENTIFIERS: (U) NUAFOSR2304A5, PB01102F



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AD-A033 059 13/2 10/3 8/1 DTIC REPORT BNLIOGRAPHY SEARCH CONTROL NO 055028  
 AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA AD-A033 003 13/2  
 CPAC INC LINCSTER N Y  
 (U) Air Force Civil Engineering Center Fiscal Year 1978  
 Air Force Technical Objectives Document  
 DEC 78 28P  
 REPORT NO AFCEC-TR-78-40  
 PROJECT NO 2093, 414N  
 TASK NO 01  
 (U) Ozone Oxidation of Meta' Plating Cyanide Wastewater  
 DESCRIPTIVE NOTE Final rept. Jan 70-Sep 79,  
 APR 70 82P  
 PERSONAL AUTHORS: Johnston, Dean A ;  
 CONTRACT NO F08038-74 C-0014  
 PROJECT NO 2084  
 TASK NO 3W  
 MONITOR 1R-78-13  
 UNCLASSIFIED REPORT

ABSTRACT. (U) This TAO describes the four Technical Planning Objectives developed to guide the conduct of research and development in passive defense techniques for the theater airbase, present studies, environmental pollution abatement and control, air mobility concepts, energy conservation, fire fighting equipment, air base support, and warm fog dispersal (Author)

DESCRIPTORS: (U) \*Civil engineering, \*Air Force planning, Planning programming budgeting, Structures, \*Environmental protection, Pollution, Air Force Facilities, Soils, Corrosion, Technology, Contracts, Shelters

IDENTIFIERS (U) Technical objective documents, PH1000, PH2101, PH2102, PH2103, P 2104, PH2084, PH2801F, PH2873F, PH28708F, Technology forecasting, Defense planning

UNCLASSIFIED REPORT

ABSTRACT: (U) Electroplating facilities, as associated with aircraft engine maintenance bases operate by the Air Force, generate quantities of wastewater contaminated with cyanides. Although traditionally treated with chlorine, a process was developed by the Houston Research Corporation under Contract No F28801-72-C 0085 using ozone to oxidize the cyanides. A demonstration plant was designed and installed at Tinker Air Force Base to treat 2000 gallons per hour of wastewater. The waste at concentration up to 10,000 ppm of total cyanide. A series of test runs proved ozone to be an effective and economically competitive for the destruction of simple cyanides and most metal complexes. The iron complex proved to be very difficult to destroy even in the presence of UV light and elevated (180 F) temperature (Author)

DESCRIPTORS: (U) \*Waste water, \*Pollution abatement, \*Cyanides, \*Oxidation, \*Rozone, Electroplating, Waste treatment, Metal compounds, Aircraft maintenance

IDENTIFIERS (U) WUAFCEC20843M03, PH28708F

AD-A033 059

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**DESCRIPTORS.** (U) \*Air pollution, \*Air Force facilities, data acquisition, Sources, Environmental protection, Data reduction, Automobile exhaust, Inventory, Aircraft exhaust, Information retrieval

**IDENTIFIERS.** (U) Exhaust emissions, National emissions data system, Storage and retrieval of aerometric data

## UNCLASSIFIED

AD A032 083 7/4 13/2 DTIC REPORT BINLIOGRAPHY SEARCH CONTROL NO 055028  
AD-A032 083 CONTINUED

AIR FORCE CIVIL ENGINEERING CENTER TYNMALL AFB FLA  
(U) The Adsorption of Chromium (VI) at the Oxide/Water  
Interface

properties, Alkaline, Phosphates, pH Factor, Toxicity,  
Hydrolysis, Water, Interfaces, Oxides, Chromates,  
Mathematical Models

DESCRIPTIVE NOTE Interim rept 1 Jul 74-30 Jun 75.  
SEP 75 20p

IDENTIFIERS (U) WJAFCEC21034C41, PE83723F

PERSONAL AUTHORS MacNaughton, Michael G.

REPORT NO AFCEC-TR-75-17

PROJECT NO 2103

TASK NO 4C

## UNCLASSIFIED REPORT

ABSTRACT. (U) Because of its toxicity, chromium has a potential environmental impact, and it is imperative that mechanisms which control the movement of this metal through the environment be known. It has been documented that adsorption to suspended and deposited materials is important in controlling the concentration of heavy metals in natural waters. Numerous previous investigations have been concerned with the adsorption of hydrolyzable heavy metals, however, chromium exists in aqueous solution as the anionic oxocomplex. In this report data on adsorption of chromium and phosphate are compared at the water interface of various metal oxides. The conclusions of this investigation are (1) for Al<sub>2</sub>O<sub>3</sub> both chromium and phosphate adsorb at low pH's; however, upon increasing pH, there is a decrease in the percentage adsorption, (2) chromium adsorption decreases with increasing ionic strength, (3) phosphate exhibits a higher specific adsorption energy than does chromium, (4) adsorption of chromium and phosphate is low for solids which have isoelectric points at low pH's, (5) with a more valid method of determining the surface potential other than the Nernst equation the simple electrical double layer model can be used to give reasonable predictions of the pH and surface charge response for adsorption of anions. (Author)

DESCRIPTORS (U) Chromium, Water pollution,  
Adsorption Anions, Complex compounds, Electrochemistry,  
Physical chemistry, Surface chemistry, Transport

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A031 783 13/2

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Waste POL Disposal through Energy Recovery

DESCRIPTIVE NOTE Final rept 1 Feb 74-1 Jun 78.

JUN 78 88P

PERSONAL AUTHORS Fink, Patrick T ; Jackson, Jerry W .

REPORT NO AFGLC-TR-78-2

UNCLASSIFIED REPORT

ABSTRACT: (U) In order to investigate the practical feasibility of combusting waste POLS (petroleum, oil, lubricants) in heating plant boilers, a field testing program was undertaken to obtain actual performance and air pollution data. Since most Air Force heating plants utilize FS-Grado (No 2, No 5) fuel or natural gas as a primary fuel source, emphasis was placed on the installation of waste POL systems at three separate Air Force bases employing the use of these fuels. Various percentages of waste POL were burned in the test boilers with the corresponding fluctuation in stack emissions documented. Results of field testing are presented in terms of air pollution, operational procedures, air pollution data, and recommendations for the safe installation of a compatible waste POL system (Author)

DESCRIPTORS: (U) \*Waste disposal, \*Oil wastes, Air pollution, Air Force facilities, Combustion Heating plants, Recycled materials, Fuels

AD-A030 598 13/2

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Improved Efficiency for Kirtland Air Force Base Solid Waste Collection

DESCRIPTIVE NOTE Final rept Jan-Aug 75.

JAN 78 41P

PERSONAL AUTHORS Lundquist, Dennis E .

REPORT NO AFCEC-TR-78-10

UNCLASSIFIED REPORT

ABSTRACT: (U) This effort was initiated to find new ways to improve Air Force base level residential solid waste collection. This study investigated two collection modifications which were intended to improve system efficiency and, thus, conserve resources. The two modifications were: (1) Optimizing the use of the refuse collection vehicles; and (2) Changing the manner of bag collection. The study results showed that large economies (exclusive of paper bag costs) could be realized if the two-system modifications were implemented together.

DESCRIPTORS: (U) \*Waste disposal, \*Solid wastes, Waste management, Air Force facilities, Collection, Cost effectiveness, Housing(Dwellings), Routing, Optimization

IDENTIFIERS: (U) Trash disposal

AD-A031 783

UNCLASSIFIED

AD-A030 598

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## UNCLASSIFIED

AD-A030 410 17/8 1/2

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION BOULDER  
COLORADO AERONAUTICS LAB(U) Development of a Doppler Radar Technique for the  
Detection of Bird Hazards to Aircraft

DESCRIPTIVE NOTE Final rept 10 May 72-12 Dec 75,

DNC 75 92P

PERSONAL AUTHORS Green, John L ; Balsaw, Ben B .

PROJECT NO AF-2103

MONITOR

AFCEC

TR-76-17

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A030 285

13/2

B/2

LITTLE (ARTHUR D) INC CAMBRIDGE MASS

(U) A Methodology for Preparing Environmental Statements

DESCRIPTIVE NOTE Final rept May 74-Aug 75,

AUG 75 217P

PERSONAL AUTHORS Hellstrom, David I .

CONTRACT NO F28801-73-D-0027

MONITOR

AFCEC

TR-75-28

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

669

**ABSTRACT** (U) The purpose of this research project was to develop a radar technique to detect the presence of flying birds potentially hazardous to aircraft. Radar aircraft runways, to distinguish them from other radar targets, to estimate the size and number of birds in order to assess the hazard. The motions of a bird in flight are characterized by a distinctive velocity spectrum that can be detected by radar. These 'aural signatures' were identified by Doppler technique and verified by visual sightings. This report provides a description of the analysis techniques, compares range-Doppler radar with a Doppler system, and also conventional radar. A discussion concerning modification of a typical radar system is included. A method of determining the aural number of birds in the target volume is discussed. The report also includes a scene-by-scene description of a film presentation made to more fully quantify the Doppler technique. (Author)

**DESCRIPTORS** (U) \*Doppler radar, \*Bird strikes, \*Aviation safety, \*Birds, Aircraft, Hazards, Detection, Radar tracking, Airports

**IDENTIFIERS** (U) \*Radar ornithology

**ABSTRACT** (U) This report provides instructions for Air Force field personnel in the methods for preparing environmental statements. The report covers the following areas: introduction to the environment, review of Air Force procedures for assessment and reporting impacts of various actions, establishing and maintaining an environmental baseline data and information system, preparation of the proposed action, description of the existing environment, identification of impacts, and identification of alternatives, unavoidable impacts, and of mitigation. The report is written for a person with a technical background, but without experience in environmental analysis.

**DESCRIPTORS** (U) \*Environmental impact statements, \*Air Force planning, \*Manuals, \*Methodology, Assessment, Reports, Data acquisition, Data bases, Information systems, Impact, Resources, Utilization, Preparation

**IDENTIFIERS** (U) Alternatives

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A030 308 19/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY(U) Evaluation of IBM Vehicle Scheduling Program for Air  
Force Base Refuse-Collection Scheduling

DESCRIPTIVE NOTE Final Rpt Feb 73-Dec 75.

APR 78 58P

PERSONAL AUTHORS Tuzzolino, Harold J .

REPORT NO CERF-EE-9

CONTRACT NO F29801-78-C-0018

MONITOR AFCEC  
TR-78-14

## UNCLASSIFIED REPORT

ABSTRACT: (U) The IBM Vehicle Scheduling Program (VSP) was used to schedule refuse collection at five Air Force bases. The application procedure and the results are presented for two of these bases. The results indicate that computer scheduling of refuse collection can reduce manpower, distance traveled, and the number of vehicles required by up to 20 percent. Difficulties involved in using the IBM program and in producing the final route maps and schedule indicate that a computer program that would determine the traversal path and draw the route should be written (or obtained if one exists).

DESCRIPTORS: (U) \*Air Force facilities. \*Solid wastes. \*Waste disposal. \*Scheduling. \*Garbage disposal. \*Route flows. \*Mathematical models. \*Computer programs. \*ORTMAN. \*Collection. \*Optimization

IDENTIFIERS: (U) \*Solid waste collection systems. \*Vehicle scheduling program

AD-A030 308

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AD-A029 734

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AD-A029 734 21/4 20/3 13/12

EXXON RESEARCH AND ENGINEERING CO LINDEN N J

(U) Evaluation of the Hazards of Static Electricity in POL  
Systems

DESCRIPTIVE NOTE Final rept Jun 74-Dec 75.

JAN 78 151P

PERSONAL AUTHORS Dukek, M G. , Lunt, R. S ; Young, D A .

CONTRACT NO F29801-74-C-0128

MONITOR AFCEC  
TR-76-1

## UNCLASSIFIED REPORT

ABSTRACT: (U) Tests were conducted at air bases and in a full-scale rig to evaluate the hazards of static electricity in POL systems. Field testing at two air bases revealed a low level of charge in JP-4 fuel delivered to aircraft through DOD filter-separators. The low levels result from the high conductivity of JP-4 due to the presence of approved DOD corrosion inhibitor and the design of filter-separators which provide considerable residence time for charge relaxation. Single stage filter separator units were shown to generate less charge than older two stage units. Paper separators charged at about half the level of paper separators. Aluminum hydrazine systems were found to have a lower charging tendency than carbon steel systems.

DESCRIPTORS: (U) \*POL storage. \*Electrostatic charge. \*Hazards. \*Static electricity. \*Static dischargers. \*Fuel filters. \*Separators. \*Jet engine fuels

IDENTIFIERS: (U) JP-4 fuel

## UNCLASSIFIED

AD-A028 528 13/2 1/5  
 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG  
 MISS  
 (U) Use of Recycled Materials in Airfield Pavements  
 Feasibility Study  
 DESCRIPTIVE NOTE Final rept Oct 74-Aug 75.  
 FEB 76 72P  
 PERSONAL AUTHORS Laving, Raymond J.  
 MONITOR AFCEC  
 TR-76-7

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 08EC38  
 AD A028 879 12/5 13/2  
 AIR FORCE CIVIL ENGINEERING CENTER TYNDALE AFB FLA  
 (U) Treatment and Recycling of Photographic Bleach Solutions  
 Using Electrolytic Regeneration  
 DESCRIPTIVE NOTE Final rept Aug 73-Dec 75.  
 JAN 76 25P  
 PERSONAL AUTHORS Bennett, Brian D.  
 REPORT NO AFCEC-TR 76-8  
 PROJECT NO AF 2054

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes an investigation of the economic and technical feasibility of recycling old pavements and used paving materials into new pavement construction and maintenance. It is in effect a state-of-the-art study based on literature reviews and job site visits. Four major procedures were identified as being used to recycle or reclaim pavements and paving materials. These are (1) removed and crushed materials, (2) removed and reprocessed materials, (3) pulverized in place, and (4) heater-planer scarifier or remix methods.

DESCRIPTORS (U) Recycled materials, Pavements, Airports, Waste disposal, Concrete, Agglomerates, Reviews, Literature surveys, Feasibility studies.

IDENTIFIERS (U) Portland cements, Asphaltic concretes

AD-A028 528

## UNCLASSIFIED

AD A028 879  
 PAGE 430 055028

## UNCLASSIFIED REPORT

ABSTRACT: (U) The use of the Mead ferricyanide Solution Management System, for batch mode regeneration of all spent ME-4 ferricyanide bleach used at the Aerospace Audio Visual Service, Norton Air Force Base, CA was investigated. Installation of the system was modified to process the effluents from multiple processors in order to increase the cost benefit of the system. Problems associated with maintaining proper bleach feed pressures and replenisher flow were encountered. Results indicated that the system did regenerate ferricyanide bleach to standards required for photoprocessing. Chemical costs using the electrolytic process were less than one half that previously associated with paraulfate regeneration.

DESCRIPTORS (U) Photographic processing, Bleaching agents, Recycled materials, Waste disposal, Cost effectiveness, Water pollution, Pollution abatement, Motion picture photography, Aerial photography

IDENTIFIERS (U) Ferricyanides

## UNCLASSIFIED

## OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A026 487 0/10

AD-A026 243 13/2 21/4

SAN DIEGO STATE UNIV CALIF CENTER FOR REGIONAL ENVIRONMENTAL STUDIES

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Ecological Assessment of Vandenberg Air Force Base, California Volume II. Biological Inventory 1974/75

(U) Air Force Fuel Dumping October 1974 to March 1975

DESCRIPTIVE NOTE. Final rept May 74-Aug 75.

DESCRIPTIVE NOTE Final rept 1 Oct 74-31 Mar 75

MAY 76 204P

AUG 75 48P

REPORT NO AFCEC-TR-75-21

PERSONAL AUTHORS Coutombe, Harry N. (Nahrdt, Clark R.)

PROJECT NO AF-1800

CONTRACT NO F4450-75-C-0008

TASK NO 19008W

MONITOR AFCEC

UNCLASSIFIED REPORT

TR-76-15-Vol-2

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Volume I, AD-A026 800

ABSTRACT. (U) The second volume of a three volume report presents the data base from a survey of terrestrial environmental conditions at Vandenberg AFB, California, carried out from July 1974 to June 1975. The study was undertaken to provide basic data for assessment of the environmental impact of the Space Transport System planned for Vandenberg AFB and for management of the land resources of the base. Details are given of the floral and faunal investigations, including locations, methods, and procedures. Narrative and tabular data are provided on climate, soils, aquatic resources, vegetation, and game and non-game vertebrates.

ABSTRACT. (U) Listings and summaries of all reported Air Force fuel dumps between 1 October 1974 and 31 March 1975 are given and are broken down by major command and by aircraft type. The distributions of fuel dumps by geographical area, size, and altitude are also examined. Several geographical areas in which fuel dumping is most frequent have been identified. Most fuel dumps are located in distinct classes and can be studied by investigating in detail a typical member of the class. The implications of this simplification for the future conduct of the fuel dumping project are discussed. (Author)

DESCRIPTORS (U) \*Ecology, \*Natural resources, \*Air Force facilities, \*Environmental management, Surveys, Rivers, Lakes, Sampling, pH factor, Temperature, Nutrients, Fishes, Trees, Shrubs, Aquatic plants, Invertebrates, Invertebrates, Productivity, Aquatic animals, Vegetation, Wildlife, Mammals, Tables(Data), California

IDENTIFIERS (U) \*Vandenberg Air Force Base, Santa Barbara County(California), Environmental impacts, Space transport system

DESCRIPTORS: (U) \*Air pollution, \*Fuels, Tables(Data), Air Force operations, Air Force facilities, Geographical distribution, Aircraft, Environmental impact statements, Altitude, Time, Weight reduction

IDENTIFIERS (U) \*Fuel dumps, F-111 aircraft, KC-135 aircraft

AD-A026 487

AD-A026 243

UNCLASSIFIED

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## UNCLASSIFIED

AD-A029 175 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 058028  
 AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
 (U) Continuous On-Line Monitoring of Total Organic Carbon  
 DESCRIPTIVE NOTE Final rept Jan-Apr 75.  
 AUG 75 34P  
 PERSONAL AUTHORS: Bennett, Brian D .  
 REPORT NO AFCEC-TR-75-18  
 PROJECT NO AF-2054  
 UNCLASSIFIED REPORT

AD-A025 800 8/8  
 SAN DIEGO STATE UNIV CALIF CENTER FOR REGIONAL  
 ENVIRONMENTAL STUDIES  
 (U) Ecological Assessment of Vandenberg Air Force Base,  
 California Volume I Evaluation and Recommendations  
 DESCRIPTIVE NOTE Final rept May 74-Aug 75.  
 MAY 76 162P  
 PERSONAL AUTHORS: Coulombe, Harry N ; Cooper, Charles F .  
 CONTRACT NO F44820 75-C-0008  
 MONITOR AFCEC  
 TR-76-15  
 UNCLASSIFIED REPORT

ABSTRACT (U) Continuous on-line monitoring of total organic carbon was performed at an Air Force sewage treatment facility using an Ionics Total Organic Carbon Analyzer. This instrument was installed and operated to determine its potential use in Air Force monitoring programs and the validity of a total organic carbon (TOC) to biochemical oxygen demand (BOD) correlation for the wastewater analyzed. Information was obtained on the operation and required servicing for proper instrument application. Analysis of data collected during this study indicated that a valid long term correlation of TOC BOD could be used to effectively monitor treatment plant performance. (Author)

DESCRIPTORS (U) \*Sewage treatment, \*Analyzers, Monitoring, On line systems, Water pollution, Carbon, Biochemical, Oxygen demand, Instrumentation, Performance (Engineering), Maintenance

IDENTIFIERS: (U) Total organic carbon, \*Water pollution detection

SUPPLEMENTARY NOTE See also report dated Aug 75, AD-A020 827

ABSTRACT (U) The first volume of a three volume report summarizes the results and conclusions of a survey of terrestrial environmental conditions at Vandenberg AFB, California, carried out from July 1974 to June 1975. The study was undertaken to provide basic data for assessment of the environmental impact of the Space Transport System (STS) planned for Vandenberg AFB and for management of the land resources of the base. The significance of Vandenberg AFB as one of the last large undeveloped areas in coastal California is discussed. Evaluations are presented of the physical aspects of the environment, including: vegetation, soils, water resources, and wildlife, including amphibians, reptiles, birds, and mammals. Species and ecosystems of high ecological sensitivity or importance are discussed in the context of the STS. Recommendations are presented for management of the renewable natural resources of the base.

DESCRIPTORS (U) \*Ecology, \*Environmental protection, \*Air Force facilities, Conservation, Management, Natural resources, Field tests, Surveys, Wildlife, Tables (Data), Vegetation, Land use, Forests, Soils, Fresh water, California, Coastal regions

IDENTIFIERS (U) \*Vandenberg Air Force Base.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A025 000 CONTINUED

AD-A025 799 15/5 15/7

Environmental impact statements, Ecosystems, Santa Barbara County/California, Local studies, Recommendations

APPLIED ENGINEERING RESOURCES INC SANTA BARBARA CALIF

(U) Air Mobility Shelter Conceptual Study

DESCRIPTIVE NOTE Final rept. Jul 74 Apr 75.

SEP 75 180P

PERSONAL AUTHORS: Bedford, R. Jaffe, M.

CONTRACT NO F29601-74-C-0112

MONITOR: AFCEC  
TR-75-29

UNCLASSIFIED REPORT

ABSTRACT (U) This report summarizes an evaluation of existing air transportable shelters and identifies areas in which improvements can be made in the future. In general, the study suggests that existing shelters have been quite successful with respect to, air transportability, overall weight, rapid erection and striking, and adaptability to diverse uses. Existing shelters have not, however, been totally satisfactory with respect to durability, repairability, compatibility with extremes of environment, and economy of elements. The majority of these problems have been identified and limited in the materials and manufacturing techniques utilized, rather than from any basic shortcomings of the shelter concepts. Accordingly, this study suggests that use of premium-quality materials, advanced manufacturing techniques, and more conservative design allowances will result in superior shelters in the 1980's.

DESCRIPTORS: (U) \*Bare bases, \*Air transportable equipment, \*Shelters, Airmobile operations, Manufacturing, Composite materials Weatherproofing, Kits, Military equipment

IAC NO PL-024815

TAC DOCUMENT TYPE: PLASTIC - MICROFILME --

TAC SUBJECT TERMS: P - (U) Composites-Air mobile shelters, Plastics-Inflatable structures, Nylon/epoxy-Air mobile shelters, Polycarbonate foam-Portable equipment, HDPE-Tents, Portable-Shelters, Shelters-Military applications.

AD-A025 800

AD-A025 799

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD A025 799 CONTINUOUS

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AD A025 183 13/2 9/2 8/13 12/1

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY(U) Evaluation of Substitute Input for NCEL Bomb Damage  
Repair Code

DESCRIPTIVE NOTE Final rept 8 Jan-8 Oct 75.

MAR 76 58P

PERSONAL AUTHORS Baird, Glenn T

REPORT NO CERF-AP-10

CONTRACT NO F29871-74-C-0030

PROJECT NO AF-2104

TASK NO 210448

MONITOR AFEC  
TR-76-4

UNCLASSIFIED REPORT

ABSTRACT (U) This research project was concerned with the evaluation of substitute input to a computer program which is used to analyze the performance of repaired bomb craters. The typical materials used in the rapid repair of bomb craters were tested in various states of stress to obtain soil strength and deformation parameters for use in the computer code. A concrete sand, two gravels, and a well-graded crushed limestone were tested in hydrostatic compression, constant mean normal stress, and triaxial compression. For evaluation of their nonlinear behavior, the nonlinear modulus of elasticity, bulk modulus, and shear modulus were determined. Laboratory testing was performed with a split-cube, axisymmetric, finite-element computer code and the nonlinear results were compared with the linear results for the selected materials. With the linear model computed from the triaxial compression tests performed at these pressures, deflections equivalent to those computed with nonlinear model can be computed. The computer input was thereby reduced and laboratory testing was greatly simplified.

AD A025 799

AD A025 183

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AD-A025 103 CONTINUED DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 AD-A025 108 13/2 7/4  
 AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
 (U) Vapor Phase Spectra for Air Pollution Studies  
 DESCRIPTIVE NOTE Final rept 1 Jul 72 31 Nov 74,  
 AUG 75 147P  
 PERSONAL AUTHORS Birge, Robert R ; Haney, James T ; Ricco,  
 Edward ;  
 REPORT NO AFCEC-TR-75-15  
 PROJECT NO AF-1900  
 TASK NO 18008#

## UNCLASSIFIED REPORT

ABSTRACT (U) Infrared absorption spectra of the following substances in the vapor phase are presented: acetaldehyde, acetonitrile, acrolein, ammonia, carbon dioxide, carbon monoxide, ethane, ethylene, formaldehyde, formic acid, hydrogen chloride, hydrogen cyanide, hydrogen sulfide, methane, methanol, nitric oxide, nitrogen dioxide, nitrous oxide, oxo, sulfur dioxide, and water. Resolution is 0.3/cm and low sample pressure further enhances fine structure of the absorption bands. The frequencies of nearly 3000 absorption lines for these compounds, accurate to 0.1/cm, are listed in tabular form. A discussion of techniques to minimize noise problems in Fourier transform spectroscopy is included. (Author)

DESCRIPTORS (U) Air pollution, Infrared spectra, Vapor phases, Fourier spectroscopy, Carbon monoxide, Carbon dioxide, Acroleins, Ammonia, Ethanes, Ethylene, Formaldehydes, Formic acid, Hydrogen chloride, Nitrogen oxides, Oxo, Methane, Sulfur oxides, Methanol, Hydrogen sulfide, Hydrogen cyanide

IDENTIFIERS: (U) Acetaldehyde, Acetonitrile, Methanol, Fourier spectroscopy

## UNCLASSIFIED

AD A024 889 1/5 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 095028  
 CLARKSON COLL OF TECHNOLOGY POTSDAM N Y  
 (U) Cumulative Deflection and Rigid Pavement Serviceability  
 DESCRIPTIVE NOTE Final rept Jul 74-Sep 78.  
 NOV 75 62P  
 AUTHOR AU/HEHS HIGHTER, William H.  
 CONTRACT NO F2801 78-C-0002  
 PROJECT NO AF 2104  
 AKA NO 2104 A  
 MONITOR AFCEC TR 75 20

AD A022 882 13/2 11/3 1/3  
 PACER ENTERPRISES INDUSTRIES INC HARNICK R I  
 (U) Activated Carbon Treatment of Phenolic Paint Stripping Wastewater  
 DESCRIPTIVE NOTE Final rept May 74-May 75.  
 AUG 75 132P  
 PERSONAL AUTHORS Perrotti, Anthony E.  
 CONTRACT NO F08033-74-C-0005  
 PROJECT NO AF-2051  
 MONITOR AFCEC TR-75-14

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes efforts to relate the energy imparted to a rigid pavement system (as measured by cumulative deflections) to the condition of that system. Analysis of raw data from the American Association of State Highway Officials Road Test showed no results that could be used for predictive purposes. Use of averaged data points indicated there exists a threshold cumulative deflection beyond which pavement serviceability changes rapidly.

DESCRIPTORS (U) pavements, \*terminal flight facilities, dynamic response, performance (Engineering), Collection life expectancy, Dynamic loads, Energy transfer

ABSTRACT (U) The use of activated carbon for removal of phenol from wastewater is well demonstrated and generally accepted treatment method. The Air Force operated a number of facilities for the depainting of aircraft and related equipment and the wastewater generated sometimes contains high concentrations of phenol. A study was conducted to ascertain both the economical and technical practicality of using a granular carbon system for treating large volumes of this type of phenol bearing wastewater. Basically, this work involved two phases. The initial phase was performed in the laboratory and involved an in-depth characterization of the wastewater and the evaluation of different activated carbons for treating this wastewater. The second phase involved operating a full scale pilot treating phenol wastewater. The carbon was exhausted and then thermally regenerated four times. The pilot plant was operated intermittently for a period of six months. The technical feasibility of using activated carbon on this specific wastewater was demonstrated and the cost of constructing and operating full size plants was determined. Color illustrations reproduced in black and white.

DESCRIPTORS (U) phenols, \*water pollution, \*paint removers, \*activated carbon, Sewage treatment, Adsorption, Concentration (Chemistry), Pilot plants, Cost estimates.

AD A024 889

AD A022 882

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 050020

AD-A022 982 CONTINUED

Field tests, Chromium isotherms, Aircraft finishes,  
Chloromethanes Removal, Air Force facilities  
IDENTIFIERS (U) \*Water pollution control, \*Industrial  
waste treatment, Design criteria

AD A021 959 1/5 12/2

AIR FORCE CIVIL ENGINEERING CENTER TYNDALE AFB FLA  
(U) Analysis of the Standard USAF Runway Skid Resistance  
Tests

DESCRIPTIVE NOTE Final report Jul 73-Dec 74,

MAY '76 258P

PERSONAL AUTHORS Williams, John H.

REPORT NO AFCEC-TR-78-3

UNCLASSIFIED REPORT

ABSTRACT: (U) Data gathered during the Air Force Civil Engineering Center (AFCEC) standard skid resistance runway construction tests during the period 15 November 1973 to September 1974 are analyzed. This report outlines the major milestones leading up to the present AFCEC program to determine runway skid resistance characteristics. Refinements made to the program, description of equipment used to determine runway skid resistance characteristics, operating and test procedures and analysis of the skid measurement program (Author)

DESCRIPTORS: (U) \*Runways, \*Skidding, \*Traction, Test methods, Texture, Concrete, Aircraft, Aircraft tires, Hydroplaning, Friction, Braking, Deceleration Measuring Instruments, Air Force, Civil engineering

IDENTIFIERS: (U) \*Skid resistance, Skidometers

AD-A022 982

AD-A021 959

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## DTIC REPORT BIBLIOGRAPHY

AD A021 352 1/8 12/2  
 NHM MEXICO UNIV ALBUQUERQUE ERIC H WARD CIVIL  
 ENGINEERING RESEARCH FACILITY  
 (U) Evaluation of liquid binders for Airfield Bomb Damage  
 Repair  
 DESCRIPTIVE NOTE Final rept 24 Apr 74-JC Jun 75.  
 JUN 75 40P  
 PERSONAL AUTHORS Nintzen, John P , Cassino, Vincent .  
 REPORT NO CERF-AP-14  
 CONTRACT NO F20801-71-C-0030  
 MONITOR AFCEC  
 1R-75-25

## UNCLASSIFIED REPORT

ABSTRACT (U) A laboratory and a field study were conducted to evaluate the use of an epoxy binder to repair bomb damage to airfield pavements. The particular repair system investigated consisted of backfilling the crater with ejected debris, sand to within 12 in of the top of the pavement and a 3/4-in uniform gravel to the surface. The gravel was stabilized by a liquid epoxy resin which had a cure time of 10 to 14 min. The field test section successfully withstood 600 passes of an F-4 tire loaded to 30,500 lb without any measurable elastic or permanent deflection.

DESCRIPTORS (U) Landing field, Bomb damage, Repair, Debris, Graveling Epoxy resins, Backfills, Stabilization, Binders

AD A021 353

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## SEARCH CONTROL NO 055028

AD A021 J52 1/8 13/3 13/2

SYRACUSE UNIV RESEARCH CORP N Y

(U) Rapid Runway Repair Study

DESCRIPTIVE NOTE. Final rept May-Aug 75.

AUG 75 51P

PERSONAL AUTHORS Royko, Leo L , Sawyer, Richard G .

REPORT NO SURC 1R-75-187

CONTRACT NO F08038-75-C-0010

MONITOR AFCEC  
 1R-75-19

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes a series of tests to evaluate a system for rapidly repairing airfield pavement using polymer concrete (synthetic polymer plus aggregate), thermally cured by microwave power. The technique, developed by the Syracuse University Research Corporation (SURC) for highway maintenance, uses a truck-mounted 50-kilowatt microwave generator to irradiate areas patched with polymer concrete. Test results indicate that the polymer concrete can be cured in a fraction of an hour, bonds well to old pavement material, is very strong, and possesses other qualities which make it naturally suited for airfield use.

DESCRIPTORS (U) Runways, Bomb damage, Repair, Polymers, Polymerization, Microwave equipment, Irradiation, Curing, Pavements

IDENTIFIERS (U) Polymer concretes

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A021 315 CONTINUED

Pavements, Craters, Weapons effects, Computer applications, Data bases, Personnel, Analysis, Soil mechanics, Tables(Data), Air Force planning

MARTIN MARIETTA AEROSPACE ORLANDO FLA  
(U) Bomb Damage Repair (BDR) Damage Prediction Volume II  
Appendices

DESCRIPTIVE NOTE. Final rept 14 Feb-15 Oct 75.

DOC 75 411P

PERSONAL AUTHORS Brooks, George W ;Cunningham, John F ;  
Mayer, Paul W ;

CONTRACT NO F2001-75-C-0093

SUBJECT NO AF-2104

TASK NO 710420

MONITOR AFCEC  
75-75-24-Vol-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Volume 1, AD-A020 941

ABSTRACT (U) Knowledge of airfield damage and the capability to predict damage from possible hostile attack are required to allow Bomb Damage Repair (BDR) personnel to plan base recovery activity and rapid runway repair. The objective of this effort was to collect existing data on airfield pavement effects, as functions of pavement and weapon effects, and to identify those parameters having a significant effect on pavement damage prediction effort, and to generate damage prediction relationships for use by BDR engineers. The collected data were placed in a consistent format in a computerized data file. By plotting the data and subjecting them to various analytical procedures, significant parameters affecting damage were identified. Mathematical relationships were developed between the data, and damage prediction relationships were generated for the three repair levels considered. These prediction relationships are in a format readily usable by field personnel and enable rapid damage prediction computations and subsequent runway repair planning operations.

SCRIPTORS (U) Landing fields, Bomb damage, Repair, Damage assessment, Mathematical prediction, Maintenance.

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## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 085028

AD-A020 941 1/6 18/4 13/2

MARVIN MARIETTA AEROSPACE OPLAND FLA

(U) Bomb Damage Repair (BDR) Damage Prediction Volume I  
Technical Discussion

DESCRIPTIVE NOTE Final rept 13 Feb-18 Oct 75,

OCT 75 138P

PERSONAL AUTHORS: Brooks, George W. Cunningham, John E.  
Mayer, Paul W.;

CONTRACT NO F28601-75-C-10033

MONITOR: AFCEC  
TR-75-24

## UNCLASSIFIED REPORT

ABSTRACT. (U) Several test programs have been conducted in recent years to define the level of damage sustained by airfield pavement systems which are subjected to conventional weapon detonations. Knowledge of airfield damage and the capability to predict damage from possible hostile attack are required to allow Bomb Damage Repair (BDR) personnel to plan, base recovery activity and rapid runway repair. The objective of the effort reported herein was to collect existing data on airfield pavement effects, as functions of pavement and weapon parameters. Identify those parameters having a significant effect on pavement damage, repair time and effort, and generate damage prediction relationships for use by BDR engineers.

DESCRIPTORS (U) Landing fields, Bomb damage, Repair, Damage assessment, Predictions, Maintenance, Pavements, Craters, Weapons effects

AD A020 941

AD A020 922

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AD-A020 922 7/3 14/2 7/5

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) The Evaporation and Degradation of N-Nitroso Dimethyl  
Amine in Aqueous Solutions

DESCRIPTIVE NOTE Final rept Feb 75-Mar 75,

MAP 75 22P

PERSONAL AUTHORS: McLaughlin, Michael G.; Stauffer, Thomas  
S.

REPORT NO AFCEC-TR-75-9

## UNCLASSIFIED REPORT

ABSTRACT. (U) The fate of N Nitroso Dimethyl Amine (NDMA) in aqueous solutions and in a 75 percent caustic waste stream which is produced in the manufacture of unsymmetrical dimethyl hydrazine (UDMH) is investigated. These studies were designed to approximate conditions which would affect evaporation and/or degradation of NDMA in an open lagoon. It was found that for basic solutions, the reaction was primarily evaporation, whereas, for neutral solutions, the reaction is low for acid solutions and accounts for half the reaction in neutral solutions. The rate of photolysis is greater in acid solutions. Additional conclusions are that nitrite severely inhibits the photolysis of NDMA in acid solutions, and an increase in ionic strength slightly reduces the evaporation rate. The implications of the above results for leaping of the caustic NDMA waste stream are that the majority of the NDMA will volatilize from the solutions very rapidly unless the waste is neutralized. If the waste is neutralized, then photolysis would predominate unless nitrite is present, in which case, little of the NDMA would leave the lagoon either by volatilization or photolysis.

DESCRIPTORS (U) Water pollution, Chemical analysis, Nitroso compounds, Carcinogens, Food, Soils, Sewage, Dimethyl hydrazine (1-1), Degradation, Public health, Photolysis, Waste water, Wastes (Industrial), pH factor, Nitrites, Evaporation

IDENTIFIERS (U) Dimethylamine/N Nitroso

LAC NO PL-900J13

AD A020 922

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-0019 107 CONTINUED

AD-0019 107 13/1 10/1

IAC DOCUMENT TYPE PLASTIC - MICROFICHE

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
(U) Optimization of Energy Usage in Military Facilities  
(Phase 1)

IAC SUBJECT TOPIC: P--(U)Organic pollution R and D.  
Waste-water pollution-R and D. N Nitroso dimethyl amine  
Evaporation N Nitroso dimethyl amine-neutralization, Z  
RTT. ZZ Unlimited

DESCRIPTIVE NOTE Interim rept Nov 74-Jul 75.

OCT 75 40P

PERSONAL AUTHORS: Hittle,D ,Herron,D ;

REPORT NO AFCEC-TR-75-22

PROJECT NO AFWL-73-223

UNCLASSIFIED REPORT

ABSTRACT: (U) A computer model was developed for predicting hourly building thermal loads and simulating the response of heating and cooling systems to these hourly loads. The rigorous algorithm employed in the program permit determination of the effects of building and system design variables on energy consumption. The report presents results of the program application to a test case building at four sites

DESCRIPTORS (U) Military facilities, fuel conservation, buildings, Heating, Cooling, Computerized simulation, Forecasting

IDENTIFIERS (U) Energy consumption, Heat consumption, Electric power consumption, Space heating, Air conditioning, Heating load, Cooling load

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## UNCLASSIFIED

## NTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055023

AD A016 318 13/2

UNRY AIRCRAFT CORP SAN ANTONIO TEX

(U) Advanced Trickling Filter for Wastewater Treatment

DESCRIPTIVE NOTE Final rept Jun-Dec 74.

JUL 76 41P

PERSONAL AUTHORS Luschee, E M

CONTRACT NO F08638-74-C-0007

PROJECT NO AF-2754

MONITOR AEGIC

TR 76 0

UNCLASSIFIED REPORT

**ABSTRACT (U):** A prototype advanced trickling filter unit using a foamed silica medium was designed, constructed, installed and evaluated. The reduction in biochemical oxygen demand (BOD) and total suspended solids (TSS) were the parameters of most interest. The design hydraulic load of the unit was 700,000 gallons per day. The design organic load (BOD) was 60 pounds per 1000 cubic feet per day. The design solids load was 60 pounds per 1000 cubic feet per day. The design organic and solids concentrations were 100 mg/l and 100 mg/l, respectively. Laboratory data show that the TSS reduction was reduced from 28 mg/l to 18 mg/l. The TSS reduction was reduced from 28 mg/l to 18 mg/l. This indicates a reduction that will allow the upgrading of existing treatment plants to a level consistent with newer effluent limitations. The installation and operation of these filters demonstrated their effectiveness and efficiency as a wastewater treatment system.

**DESCRIPTORS (U):** Sewage treatment, Performance (Engineering), Construction, Efficiency, Oxygen Solids, Concentration (Chemistry), Installation, Costs.

**IDENTIFIERS (U):** Trickling filters, Design, Biochemical oxygen demand, Suspended solids, Glass Cellulose.

AD A016 318

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AIR FORCE CIVIL ENGINEERING CENTER TYNDALE AFB FLA

(U) Efficiency of Silver Recovery from Air Force Photographic Operations

DESCRIPTIVE NOTE Final rept Aug 74-Jun 75.

JUL 75 34P

PERSONAL AUTHORS Bennett, Brian D

REPORT NO AFCEC-TR-76-11

PROJECT NO AF-2054

TASK NO 205403

UNCLASSIFIED REPORT

**ABSTRACT (U):** In order to ascertain the efficiency of the silver recovery techniques presently employed at the United States Air Force photographic processing facilities a field sampling program was undertaken to obtain actual performance data. Since silver recovery by metallic replacement utilizing cartridges was found to be the most frequently applied method of recovery, emphasis was placed on this recovery technique. An electrolytic recovery tailing operation was also sampled to determine the efficiency of recovery utilizing this technique. Results of this study are reported in terms of cartridge performance with time, volume of fix processed and silver recovery. Data reflect actual in-the-field efficiencies and indicate that the silver recovery techniques are available for Air Force application.

**DESCRIPTORS (U):** Silver, Reclamation, Recovery, Photographic film, Civil engineering, Efficiency, Electrolysis, Processing, Water pollution, Extraction.

**IDENTIFIERS (U):** Electronics, Silver recovery, Photographic waste.

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 05058

AD A013 08W

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DTIC REPORT BIBLIOGRAPHY

AD A010 723

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AIR FORCE CIVIL ENGINEERING CENTER LYNNALL AFB FLA

AIR FORCE CIVIL ENGINEERING CENTER LYNNALL AFB FLA

(U) LocArch Shelter

(U) Methods for Reducing the Slipperiness of Painted Runway Markings

DESCRIPTIVE NOTE Final rept Dec 73-Aug 74.

DESCRIPTIVE NOTE Interim rept 1 Jun 74-1 Apr 75.

MAY 76 171P

MAY 76 24P

PERSONAL AUTHORS  
Bandy Earl T

PERSONAL AUTHORS Scutten Jean R ,McDonald Bernard D

PERSONAL AUTHORS Black Thomas J , III.

REPORT NO AFCEC 10 76 1

REPORT NO AFCEC TR-76 8

PROJECT NO AF 3095

PROJECT NO DL 04-10

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) The report describes the erection, field testing and disassembly of the LocArch air transportable aircraft shelter. The outcome of the shelter evaluation revealed the design concept to be basically sound but deficiencies existed in the arch panels and the end closure. An in depth analysis of the shelter components was conducted during the test program. The entire shelter system was subjected to simulated environmental tests to evaluate its performance for possible world wide use.

DESCRIPTORS (U) shelters ,Military aircraft ,Expandable structures ,Assembly , Panels ,InneryComb ,Structures , Climatic field tests ,Environmental tests ,Hazard(Structural) Mobile

IDENTIFIERS (U) Evaluation ,Bare base project

ABSTRACT (U) The project investigated four test sections on asphalt concrete (AC) and eight test sections on portland cement concrete (PCC) for methods of reducing runway paint marking slipperiness. Periodic paint removal enables AC surfaces to maintain adequate skid resistance. Mixing small, angular aggregate with the glass spheres for the standard airfield marking maintains skid resistance at least equal to that of the adjacent unmarked pavement.

DESCRIPTORS (U) pavements ,Runways ,Skidding ,Markers ,Paints ,Removal ,Bituminous coatings ,Test methods ,Surfaces ,Friction ,Test equipment ,Military facilities

IDENTIFIERS (U) Portland cements

AC A013 08W

AD A010 723

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 095028

AD A008 473

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AIR FORCE CIVIL ENGINEERING CENTER TYNDAL AFB FLA  
(U) Procedure for the Non-Destructive Evaluation of  
Flexible Airfield Pavements

DESCRIPTIVE NOTE Final rept Oct 72-Jan 75

JAN 75 58P

PERSONAL AUTHORS Hanson, Douglas I .

REPORT NO AFCEC TR-75-1

UNCLASSIFIED REPORT

ABSTRACT (U) A procedure for the non-destructive evaluation of flexible airfield pavements is presented. The procedure consists of accomplishing a condition survey using a mechanistic procedure and the accomplishment of a deflection study using a Benkelman Beam and an aircraft at close to maximum load. Procedures are developed and presented for use in the prediction of either the allowable aircraft gross load at specified operational levels or the production of the allowable coverage levels at specified gross loadings.

DISCRIPTORS (U) Pavements, Runways, Stiffness, Deflection, Pavement Engineering, Load Forces, Defects (Structures), Ratings, Flexible Structures, Nondestructive Testing

IAC NO HT-003771

IAC DOCUMENT TYPE NTAC - MICROFICHE --

IAC SUBJECT TERMS N--(U) PAVEMENTS, LOADS (FORCES), DEFLECTION, TESTING, TEST METHODS.

AD A008 473

UNCLASSIFIED

AD A007 033 15/3 14/2  
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL  
AMERICAN RESEARCH DIV

(U) Nondestructive Inspection of Shelter Panels

DESCRIPTIVE NOTE Final rept Sep 73-Nov 74,

JAN 75 91P

PERSONAL AUTHORS Kraska, Irvin R ,Wolf, John J .

CONTRACT NO F33619-71-C-1852

PROJECT NO AF-2054

TASK NO 205402

MONITOR AFCEC

TR-75-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also report dated May 74, AD-782  
221

ABSTRACT (U) This report summarizes the results of an effort to develop equipment and procedures to inspect sandwich panels in air transportable shelters in the field. A rapid and simple-to-operate system has been developed, utilizing a unique eddy sonic technique for non-invasive panels and pitch catch ultrasonic techniques for non-invasive panels. The system is capable of detecting and free pulsing in the panels and is capable of detecting with the system. A prototype model has been successfully field tested.

DISCRIPTORS (U) Shelters, Sandwich panels, Nondestructive testing, Air transportable equipment, Bonding, Ultrasonic tests, Defects (Materials), Field tests

IDENTIFIERS (U) Delamination

IAC NO NT 010875

IAC DOCUMENT TYPE NTAC - MICROFICHE -

IAC SUBJECT TERMS N (U) EDDY-SONICS, ULTRASONIC

AD A007 033

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DYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

AD-A007 033 CONTINUED

INSPECTION, \*SANDWICH CONSTRUCTION, INSPECTION, UNKNOV.  
DEFECTS(MATERIALS).

AD-A008 400 11/0 13/2

AIR FORCE CIVIL ENGINEERING CENTER IVNDALL AFB FLA

(U) Civil Engineering Corrosion Control Volume III  
Cathodic Protection Design

DESCRIPTIVE NOTE Final rept May 72-Nov 74.

FEB 75 202P

PERSONAL AUTHORS West, Lewis H ,Lewicki, Thomas F :

REPORT NO AFCEC-TR-74-8-Vol-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, AD/A-004 083

ABSTRACT. (U) The report is specifically written for Air Force Civil Engineering personnel but can be useful to all Agencies of the Federal Government. It covers mainly Real Property and Real Property Installed Equipment It deals with corrosion and corrosion control of buried and submerged metal structures. Causes and theory of corrosion, material selection, protective coatings, and cathodic protection application are included. The information contained herein will be useful for solving all corrosion problems encountered on real property and real property installed equipment. Portions of this document are not fully legible

DESCRIPTORS (U) \*Corrosion inhibition, \*Cathodic protection, Underground structures, Underwater structures, Corrosion, Protective coatings, Civil engineering, Materials, Selection

AD A007 033

AD-A008 400

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VALUE 451 055028

## UNCLASSIFIED

AD-A006 384 7/1 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 051028  
 THOKUL CORP BRIGHAM CITY UTAH WASATCH DIV  
 (U) The Treatment and Analysis of Cyanide Wastewater  
 DESCRIPTIVE NOTE Final rept Sep 73-Dec 74.  
 FEB 75 122P  
 PERSONAL AUTHORS Clark, D P , Poulter, L W , Wilson, D W  
 , Christensen, W N  
 CONTRACT NO F08638-74-C-0001  
 PROJECT NO AF-2094  
 TASK NO 205403  
 MONITOR AFCEC  
 TR-74-6

## UNCLASSIFIED REPORT

ABSTRACT (U) The report concerns the treatment of industrial wastes containing cyanides, especially wastes from electroplating processes. The prototype system treatment concept is a partially chlorination via electrolytic generation of chlorine in the waste water design and operating aspects are discussed. Other cyanide treatment processes are reviewed and analytical techniques are discussed

DESCRIPTORS. (U) \*Cyanides, \*Chlorination, \*Electroplating, \*Water pollution, \*Prototypes, \*Chemical analysis, \*Test methods, \*Waste treatment, \*Electrolysis, \*Electrochemistry, \*Pilot plants, \*Performance(Engineering)

IDENTIFIERS (U) \*Industrial waste treatment, \*Water pollution control, \*Water analysis

IAC NO PL-901180

IAC DOCUMENT TYPE PLASTIC - MICROFICHE --

IAC SUBJECT TERMS P--(U)Prototypes, Chlorination, Cyanides, Waste waters, Streams, Industrial waste, Electroplating, Treatment plants, Thiolol, Scrubbers, Testing, Effluents, Sampling, Stack gases, Emissions, Design ZZ MYDP, ZZ Unlimited

AD-A006 384

AD A006 140

UNCLASSIFIED

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## UNCLASSIFIED REPORT

ABS/RACT (U) This document presents a computer program which computes Allowable Gross Loads (AGL's) for various wheel configurations on rigid airfield pavements. Full program documentation, including flow charts, program listing and sample output are included

DESCRIPTORS (U) \*Landings fields, \*Pavements, \*Load(Forces), \*Concrete, \*Traffic, \*Capacity(Quantity), \*Weight \*Computer programs

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A004 989 11/8 13/2

HINCHMAN CORP DETROIT MICH

(U) Civil Engineering Corrosion Control Volume II  
Cathodic Protection Testing Methods and Instruments

DESCRIPTIVE NOTE. Final rept May 72-Nov 74.

JAN 75 128P

PERSONAL AUTHORS West, Lewis H , Lewicki, Thomas F :

CONTRACT NO F33615-72-C-0400

MONITOR: AFCEC  
TR-74-8-Vol 2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 1, AD/A-004 082

ABSTRACT (U) Laboratory and field test methods are discussed. Some basic test instruments are described and their application in the field is discussed

DESCRIPTORS (U) \*Corrosion inhibition, Civil engineering, Cathodic protection, Underground structures, Underwater structures, Corrosion, Test methods, Test equipment

AD-A004 082 11/8 13/2

HINCHMAN CORP DETROIT MICH

(U) Civil Engineering Corrosion Control Volume I  
Corrosion Control - General

DESCRIPTIVE NOTE Final rept May 72-Nov 74.

JAN 75 293P

PERSONAL AUTHORS West, Lewis H , Lewicki, Thomas F :

CONTRACT NO F33615-72-C-0400

MONITOR: AFCEC  
TR-74-8-Vol 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, AD/A-004083

ABSTRACT (U) The report deals with corrosion and corrosion control of buried and submerged metal structures. Causes and theory of corrosion, material selection, protective coatings, and cathodic protection application are included. The information contained herein will be useful for solving all corrosion problems encountered on real property and real property installed equipment

DESCRIPTORS (U) \*Corrosion inhibition, Civil engineering, Corrosion, Underground structures, Underwater structures, Cathodic protection

AD-A004 083

AD-A004 082

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## CTIC REPORT BIBLIOGRAPHY

## SEARCH CONTROL NO 055028

AD- 783 518

8/5

MISSOURI UNIV COLUMBIA JOHN M DALTON RESEARCH CENTER

(U) Investigation of the Effects of Low Intensity Electrical Currents on Wound Infection and Healing

DESCRIPTIVE NOTE Annual summary rept 'no 2, 1 Jul 72-30 Jun 73.

FE5 74

32P

PERSONAL AUTHORS Rowley, Blair A.; McKenna, John M.; Volcott, Lester E.; Chase, Gerald R.;

CONTRACT NO. DADA17-72-C-2006

## UNCLASSIFIED REPORT

ABSTRACT (U) The report presents the results of a threefold project: application of cyclic electrical current to *Pseudomonas aeruginosa* infection, enhancement of wound healing using low level direct currents, and electrical current effects on tissue cell cultures

DESCRIPTORS (U) \*Electric current, \*Healing, Wounds and injuries, Tissue culture, Bioelectricity, Pseudomonas aeruginosa, Bacteria, Infectious diseases, Experimental data, Therapy, Rabbits, Laboratory animals

AD- 782 221

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14/2

GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL AMERICAN RESEARCH DIV

(U) Nondestructive Inspection of Shelter Panels Phase 1 Functional Model

DESCRIPTIVE NOTE Interim rept Sep 73-Apr 74.

MAY 74

88P

PERSONAL AUTHORS: Kraska, Irvin R.; Wolf, John J.;

CONTRACT NO F33615-71-C-1852

PROJECT NO AF-2054

TASK NO 205402

MONITOR: AFCCIC  
TR-74-3

## UNCLASSIFIED REPORT

ABSTRACT (U) The report summarizes the first phase of an effort to develop equipment and procedures to inspect sandwich panels in air transportable shelters in the field. A rapid and simple-to-operate system has been developed, utilizing a unique eddy sonic technique for metal-faced panels and pitch-catch ultrasonic techniques for nonmetal faced panels. The location(s) of debonds and free moisture in the panel are reliably detectable with the system. A functional model has been successfully field tested (Author)

DESCRIPTORS (U) \*Shelters, \*Sandwich panels, \*Nondestructive testing, Ultrasonic tests, Air transportable equipment, Bonding, Osarets(Materials), Field tests

IAC NO NT-008479

IAC DOCUMENT TYPE NTIAC MICROFICHE --

IAC SUBJECT TERMS N--(U)\*INSERVICE INSPECTION, \*CONSTRUCTION, \*PANELS(STRUCTURAL), \*SANDWICH CONSTRUCTION, UNBOND, WATER, MOISTURE, CONTENT, DEFECTS(MATERIALS), AIR FORCE EQUIPMENT, LAMINATES, RELIABILITY, FIELD TESTS, DETECTION, MAINTENANCE,

AD- 783 518

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 085028

AD- 782 221 CONTINUED

DEVELOPMENT, TEST EQUIPMENT, TEST SPECIFICATIONS,  
PROCEDURES, TEST METHODS, METALS, SHEETS, FIBERGLASS,  
REINFORCED PLASTICS, PAPER, FORTIFICATION, STRUCTURES, MOOR,  
FOAM, EDDY-SONICS, EDDY CURRENT INSPECTION, ULTRASONICS,  
ULTRASONIC TESTING, HIGH FREQUENCY, LOW FREQUENCY,  
LABORATORY EQUIPMENT, EXPERIMENTAL DATA, COMPLAINTS,

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